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THE RUBBER AGE AND TIRE NEWS

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The Extraction of Rubber Goods *

By S. W. Epstein and B. L. Gonyo

In rubber analysis, where rubber is determined indirectly, as the difference between 100 per cent and the sum of the organic extracts, ash, and total sulphur, it is important that the extracts represent as much as possible of the organic materials which were added to the rubber batch and which are not determined separately. Those who have tried to extract glue from a vulcanized compound containing it, by means of boiling water, know how tenaciously rubber clings to certain admixed materials. In this work it was our intention to ascertain as far as possible how much, if any, soluble organic material is retained in a compound after it has been extracted with acetone for eight hours and chloroform for four hours in the usual way.

For this purpose we chose a cheap rubber mixture containing mineral rubber and pine tar and extracted it successively as follows:

EXPERIMENT I

	Hours	Per cent
(a) Acetone extract	8	10.56
(b) Chloroform extract	4	2.00
(c) Mixture of chloroform and acetone	4	2.00
Total		14.56

EXPERIMENT II

	Hours	Per cent
(a) Acetone extract	8	10.16
(b) Chloroform extract	4	2.0
(c) Mixture of carbon bisulphide and acetone	4	3.5
Total		15.66

Extracts (c) and (d) 2.0 per cent and 3.5 per cent respectively, are not removed in the standard procedure and therefore give us the first indication that organic material is retained in the rubber after the usual extractions have been carried out.

The residues from experiments I and II were now digested in 25 cc of cresol (B. P. 195°) for four hours at 165° C. The solution obtained was then diluted with petroleum ether, and allowed to stand over night. In the morning it was filtered upon a Gooch crucible, and washed thoroughly with petroleum ether and boiling benzene. The filtrate contained vulcanized rubber, while the pad presumably retained only the fillers. Our experience with cresol as a solvent for vulcanized rubber has shown that there is on the pad no material soluble in acetone or chloroform when a compound containing only rubber, sulphur and inorganic filler is treated with cresol in the manner given above. However, when this compound which contained pine tar and mineral rubber was treated in the same way, acetone extracted (I) 1.6 per cent and (II) 1.12 per cent respectively, from the material on the pad. These figures represent a part of these organic additions which remained in the rubber after it was extracted.

This extract seems to have been released by the dissolution of the rubber in the compound. Further, when the pad was washed with hot 10 per cent hydrochloric acid and water, and then extracted with acetone again, the following extracts were obtained: (1) 3.28 per cent and (II) 3.88 per cent. In this case this material was retained by the fillers themselves and was released when they were dissolved out. A mixture of 50 per cent acetone and 50 per cent carbon bisulphide extracted (I) 1.64 per cent, (II) 0.92 per cent additional.

Arranging the extracts in the order in which they were obtained, our results are:

EXPERIMENT I

Acetone extract on original sample	10.56	A
Chloroform extract on residue	2.0	A
Additional extract obtained by means of a mixture of chloroform and acetone	2.0	B
Acetone extract on the total fillers which were separated from the rubber by means of cresol	1.6	C
Acetone extract on the residue after it had been washed with 10% hydrochloric acid	3.3	C
Additional extract obtained by washing with a mixture of carbon bisulphide and acetone	1.6	C
Total extracts	21.1	

Of this total of 21.1 per cent of extractable material only 12.56 per cent is obtained in the regular procedure, while (B) and (C) totaling 8.5 per cent are left behind and are therefore reported as rubber hydrocarbon.

EXPERIMENT II

Acetone extract on the original sample	10.16
Chloroform extract on the residue	2.00
Additional extract obtained by means of a mixture of carbon bisulphide and acetone	3.5
Acetone extract on the total fillers which were separated from the rubber by means of cresol	1.12
Acetone extract on the residue after it had been washed with 10% hydrochloric acid	3.88
Additional extract obtained by washing with a mixture of carbon bisulphide and acetone	0.92
Total extracts	21.58

In this case, of the total of 21.6 per cent of extractable material, only 12.2 per cent is obtained in the regular procedure, while (B) and (C) totaling 9.4 per cent are left behind.

It is easy to see therefore that in the case of cheap compounds, the figure for rubber obtained by the "difference" method cannot be reliable at all, because of the retention of the organic material extracted as under (B) and (C).

As long as the ashing method is used, it is clear that an accurate figure for rubber cannot be expected for this reason. At best it can be but an approximation.

In connection with this work attention is drawn to the use of mixed solvents such as chloroform-acetone and carbon bisulphide-acetone which were used above. It was found with Experiment I that a mixture of chloroform and acetone extracted 2.0 per cent in four hours, after the usual acetone and chloroform extractions had been run. Likewise, with Ex-

* Published by permission of the Director of the Bureau of Standards. Paper read before the Rubber Division of the American Chemical Society at its Philadelphia meeting, September, 1919.

periment II a mixture of carbon bisulphide and acetone extracted 3.5 per cent in the same way. Such additional extracts, although they do not remove all of the material, nevertheless make the approximation closer. Considerable work has been done on the effectiveness of such mixed solvents.

It was discovered when washing the pad through which a cresol solution of rubber had been filtered, that usually a second extract of considerable weight could be obtained by subjecting the pad to alternate washings with acetone and carbon bisulphide, after it was presumably free from all extractable material. We found that the coloration, due to material being extracted out, lasted only a short while but reappeared on changing to the other solvent. The effectiveness of such alternate washings we believed to have been the result of a mixture of the solvents which was formed on the pad by the last few drops of the one solvent with the first few of the second which was being poured on. To prove this we tried washing with a mixture of equal volumes of the two solvents. The solvent power of such a mixture we found to be surprising. After washing with this mixture it was found that no further extract could be obtained by the alternating effect mentioned above. This result of washing alternately with two solvents was noticed when we were working on the determination of free carbon in rubber goods, but we did not at that time grasp its significance. In this determination the rubber sample is treated with hot nitric acid, this solution filtered upon a Gooch, and the pad washed with nitric acid, acetone and chloroform. It was found that this same pad, presumably free from extractable material, gave further extracts, in many cases, when the solvents were alternated.

Constant Boiling Mixture Used

Finding that such mixtures as acetone—carbon bisulphide and acetone—chloroform, were more effective than the simple solvents in washing residues on Gooch pads, it occurred to us that if a constant boiling mixture of these solvents could be obtained this mixture might find application in the extraction of rubber goods in the Soxhlet.

Ryland[1] found that a mixture of 55 per cent carbon bisulphide and 45 per cent acetone by volume has a constant boiling point of 39.25° C.—likewise a mixture of 68 per cent chloroform and 32 per cent acetone by volume boils constantly at 64.7° C. Accordingly, it was decided to extract samples of cheap rubber with acetone for eight hours, and then with such a constant boiling mixture and compare the weight of extract so obtained with that obtained by means of pure carbon bisulphide, or pure chloroform.

It was plain from the results obtained that chloroform is slightly better than carbon bisulphide as a solvent for extracting rubber; while the constant boiling mixture, whether it be 55 per cent carbon bisulphide—45 per cent acetone, or 68 per cent chloroform—32 per cent acetone, is certainly a much more efficient solvent than either carbon bisulphide or chloroform. These mixtures removed extracts that in some cases were astonishing. In case I, carbon bisulphide extracted 1.82 per cent, while the mixtures extracted 6.4 per cent, and 6.8 per cent respectively. Case VI was even more striking for carbon bisulphide removed only 0.43 per cent while the mixture of 55 per cent carbon-bisulphide and 45 per cent acetone removed 2.54 per cent.

Further, these results indicate that one extraction with a constant boiling mixture may take the place of the two extractions, namely acetone for eight hours, followed by choloroform for four hours, according to common practice in the rubber laboratory today. Work was carried out in order to ascertain whether such a substitution would be possible. The mixture used in the work was made by distilling a mixture of 55 per cent by volume of carbon bisulphide and 45 per cent by volume of acetone over copper at a temperature of 39.25° C. The solvent therefore contained no sulphides or free sulphur so that sulphur determined in the extracts could not be attributed to the solvent. Likewise, the mixture of 68 per cent by volume of chloroform and 32 per cent by volume of acetone was freshly distilled, and contained no sulphur.

Results Obtained

A study of the above revealed:

(a) that a small amount of sulphur, usually less than 0.1 per cent, is extracted by the chloroform.

(b) that about the same amount of sulphur is extracted by the mixture of 55 per cent carbon bisulphide and 45 per cent acetone when it is used in place of chloroform.

(c) that either mixture extracts from the original sample, in eight hours, as much or more material than the sum of the extracts obtained by the eight hour acetone extraction and the four hour chloroform extraction. Samples XIII and XIV are notable examples of the greater extracts that are sometimes obtained by the use of the mixed solvents.

(d) that either mixture extracts from the original sample, in eight hours, as much or more material than the sum of the extracts obtained by an eight hour extraction with acetone and a four hour extraction with a mixture of 55 per cent carbon bisulphide and 45 per cent acetone.

(e) that the free sulphur present in the extracts obtained by the use of the mixtures is usually from 0.1 per cent to 0.3 per cent higher than the amount present in the acetone extract.

(f) that there seems to be no advantage in extracting twelve hours or longer with the mixed solvents, since results are relatively the same after twelve hours as after eight hours.

(g) that the mixture of carbon disulphide and acetone does not decompose during the extraction to liberate sulphur or sulphur compounds and in this way affect the free sulphur determination.

(h) that the mixture of 68 per cent choloroform and 32 per cent acetone produces heavier extracts than that of 55 per cent carbon bisulphide and 45 per cent acetone.

The next step in the work was to determine the effect of the mixed solvents on high grade stocks for the purpose of possibly being able to determine what varying solution effects they would have on vulcanized rubber. Four compounds containing A-70 per cent, B-85 per cent, C-95 per cent and D-45 per cent of rubber respectively were extracted eight hours with acetone and four hours with chloroform and then one was subjected to four hours additional extraction with choloroform, another to four hours with 55 per cent carbon bisulphide —45 per cent acetone, and a third to four hours with 68 per cent choloroform and 32 per cent acetone with the following results:

	A. 70% Rubber.	B. 85% Rubber.	C. 95% Rubber.	D. 45% Rubber.
Sample 1—Extract obtained by four hours' additional extraction with chloroform	0.38	0.37	0.69	0.25
Sample 2—Extract obtained by four hours' additional extraction with 68 per cent chloroform—32 per cent acetone	0.63	0.69	1.28	0.50
Sample 3—Extract obtained by four hours' additional extraction with 55 per cent carbon bisulphide—45 per cent acetone	0.05	0.22	0.21	0.00

All three solvents dissolve vulcanized rubber to an extent which seems to depend upon how heavily it is compounded. It is interesting to note that the mixture of 68 per cent chloroform—32 per cent acetone exhibits this ability to dissolve rubber to a marked extent. The rubber dissolved by it in the above is nearly twice that dissolved by pure choloroform. On the other hand the mixture of 55 per cent carbon bisulphide—45 per cent acetone hardly exhibits this ability at all, so that the rubber dissolved by it is inappreciable as compared with that dissolved by chloroform or the mixture of chloroform and acetone. Obviously, this is a point in favor of the use of the mixture of 55 per cent carbon bisulphide—

[1] Ryland; J. Amer. Chem. Soc. 1899, 22, p. 384 See also Young, Fractional Distillation, pp. 68 and 69.

45 per cent acetone. The point is well borne out when high grade stocks are used to compare the extracts obtained by acetone, chloroform and the mixture of carbon bisulphide and acetone.

Percentage of Rubber.	Sample.	Combined extract obtained by extraction for eight hours with acetone and four hours with chloroform. Extract.	Free sulphur.	Extract obtained by extraction for eight hours with a mixture of 55 per cent carbon bisulphide and 45% acetone. Extract.	Free sulphur.
45	E	2.40	0.72	2.0	0.71
45	F	2.7	0.64	1.9	0.63
75	G	4.5	0.37	4.1	0.38
45	H	2.7	1.7	1.7	1.8
85	I	4.3	0.82	3.6	0.76

The results obtained by the carbon bisulphide-acetone mixture on these high grade compounds are in every case lower than the sum of the acetone and chloroform extracts, as would be expected from the work carried out on samples A, B, C and D. The figures for free sulphur are also in accordance with previous statements given here.

It is evident therefore that it is highly advantageous to use the mixture of carbon bisulphide and acetone to take the place of acetone and chloroform, because of this less active solution effect upon rubber as shown.

Before recommending the adoption of this mixed solvent, a few words must be said about deterioration of the solvent, and blank extracts that will form in it. It was found that the freshly distilled mixture would give no blank, and at the end of two weeks would still give no blank. However, at the end of a month's storage 75 cc. of the mixture would give a residue which, although it contained no sulphur, yet it weighed up to 0.006 gram. Therefore it is advised that where the mixture is being used in large quantities for routine analysis that it be redistilled over copper every week. Where it is used only occasionally, it should be mixed up fresh and distilled before using.

The Summary

1. Extraction for eight hours with acetone followed by four hours extraction with chloroform does not remove all soluble material from some rubber compounds.

2. After a rubber sample has been extracted with acetone it was found:

(a) that chloroform in every case extracted slightly more material than carbon bisulphide.

(b) that constant boiling mixtures such as 55 per cent carbon bisulphide—45 per cent acetone and 68 per cent chloroform—32 per cent acetone extracted from many cheap compounds considerably more material than either chloroform or carbon bisulphide.

3. The constant boiling mixture of 68 per cent chloroform and 32 per cent acetone exhibits a marked ability to dissolve vulcanized rubber, as contrasted to the mixture of 55 per carbon bisulphide—45 per cent acetone, which hardly exhibits this ability at all.

4. It is recommended that the constant boiling mixture 55 per cent carbon bisulphide and 45 per cent acetone be used in place of acetone and chloroform to extract rubber samples since:

(A) It eliminates one extraction with the necessary weighings.

(B) Extraction is complete in eight hours while the acetone and chloroform extractions require a total of twelve hours.

(C) The extraction of free sulphur is complete.

(D) A rubber analysis in which the mixed solvent is used, is more accurate than that in which acetone and chloroform are used separately, because

I. Little or no rubber is dissolved by this mixture, as compared with chloroform, which will in some cases dissolve considerable quantities.

II. The extraction of cheap rubber compounds is more complete, since the extracts obtained are greater than the sum of the acetone and chloroform extracts.

Handling Salesmen at Lower Cost

The first volume of the Shaw Selling Series, "Handling Salesmen at Lower Cost," edited by the Shaw Bureau of Business Standards, has just been published by the A. W. Shaw Company of Chicago. Other volumes of the series are: "More Sales Through Advertising"; "Organizing for Increased Sales"; "Good Will, Trade Marks, and Unfair Trading," and "Graphic and Statistical Sales Helps."

"Handling Salesmen at Lower Cost" contains up-to-the-minute information on every phase of sales management. Part I, "Building Up a Sales Force," suggests first of all methods of hiring—where to look for salesmen—is it best to advertise—whether to look for trained or untrained workers—what qualifications to go after—how to decide whether the applicant has the desired qualifications. There are in addition application blanks that can be adapted without difficulty to almost any business.

Other sections offer valuable tips on placing salesmen in the right territories, on wise supervision, sales reports, letters, personal contact, talks, contests, and so on.

Perhaps the most valuable material in the volume is that on selling costs, which is an outgrowth of a country-wide investigation made by the Bureau of Business Standards of the Shaw Publications. Whatever line of business a man is in, he is sure to find these cost figures illuminating. Sales managers can check up their selling mosts with these cost figures and establish a basis for judging whether theirs are extravagant or economical. If a sales manager has no adequate method of determining what it is costing him to sell, Chapter VII, "How to Figure Costs More Accurately," will tell him how other successful business men are meeting the problem and enable him to profit by their experience. Some of the very forms they are using for this purpose are reproduced here—and a few slight changes will suit them to the individual needs of almost any business. Numerous charts and photographs reinforce the reading matter. The volume contains 186 pages and is bound in blue vellum.

American Goods and Foreign Markets

"The plain fact seems to be that consideration of the economic welfare of Europe as a whole has been subordinated to national aspirations," says the Guaranty Trust Company of New York in the current issue of its publication, "American Goods and Foreign Markets."

"For more than a year," it continues, "the chancelleries of Europe have been given over to political bickerings while business interests have been either neglected altogether or so hedged about by restrictions incidental to the maintenance of the war basis that all large efforts to solve their problems have been of little avail. Now that the consequences appear in a depreciation of exchanges to the danger point, there is every reason to believe that the next few months Europe will evolve some broad-gauged plan for the rehabilitation of her economic affairs."

The Guaranty Trust Company then points out that the decline in European exchanges, by forcing Europe to curtail her purchases in America to the line of strict necessities challenges the far-sightedness of the American producer. "Here is his opportunity," it explains, "to test his ability to compete in a world market before his competitors have entirely freed themselves from their difficultities. All the chances are in his favor, but he must exercise greater care than was needful during the war period. Frequently he will have to let the present shadow go in order to make sure of the future substance. It is a time full of opportunities for the trader of broad vision and fine appreciation of the subtleties involved in holding a market."

What I Would Do If I Were a Foreman

By Mark M. Jones

Director of Personnel, Thomas A. Edison Industries

If I were a foreman I would first analyze my own job and endeavor to determine my true status in the organization. I would study the theory of the organization with the view of tracing out the particular lines of responsibility running to my position.

Having determined upon this step, I would probably discover that whether the business is large or small, the executive head of it is theoretically doing everything in the business. He is keeping the books, selling the goods, manufacturing and shipping the product,—and doing everything else, whether there are ten thousand people in the organization or ten. Having definitely decided that the executive head is actually doing it so far as final responsibility is concerned, I would then conclude that inasmuch as we have passed from the individual state in industry, he has been unable actually to do everything referred to above, and has delegated certain responsibilities to other persons. By so doing he has made that person an agent, and I, being his foreman and his agent, should do the things he would do if he were in my position. I would therefore feel that every thought and act, so far as the responsibility resting upon me is concerned, should be as nearly as possible that of the head of the business. I would endeavor to so act that in every instance I would do the same thing the owner would do if he were in my position. I might not always do it, but I would make a great effort toward it.

A Man Cannot Fight with Himself

Having arrived at that conclusion, I would soon observe that other foremen around me were lacking in appreciation of these fundamentals, indulging in unnecessary arguments and losing time over minor questions, such as in what column a certain charge should be placed, or whether a truck belongs to this department or that, or whether this man ought to be transferred, etc. I would see that such arguments have no status in the general scheme of things where one man does everything. It rather seems ridiculous to me to think back, and, considering that one man is doing everything, justify quarrels between two parts of the same man. How can a man fight with himself?

When two men under the same executive head do not work together you have an example of a man fighting himself. When the foreman producing the goods ahead of me, or the man to whom the products of my department are passed, comes in with something worthy of consideration, I can take it up from the standpoint of the management and soon realize that it is far beyond a personal matter. I am simply doing what the owner would do in the same situation; the foreman of the department ahead of me is doing the same thing; the foreman of the department to which my products go is also doing the same thing. After discussion, we should be able to arrive at an understanding. This, of course, will come about, providing we all understand our true status. Following this line of argument still further, I can see that after all, there is no place in industry for the man who cannot cooperate with others. I soon see that the day of the individual is over, and that a man must study human relations if he expects to exist in the world at all. The only way he can avoid human interdependence seems to be to go into the depth of the woods and stay there, and, of course, getting there would be impossible without the cooperation of others! It therefore seems clear that we have long since passed the day where we can utterly disregard the other fellow.

Having firmly fixed in my own mind the fact that I am simply the representative pro tem of the executive head of the enterprise, so far as my particular department is concerned, I can approach my dealings with workers in the department with a better understanding of what to do and what not to do. As I am simply the agent of another, there is no reason in the world why I should become incensed over anything. A worker of strong personality may assert himself in a vigorous manner which I may not clearly understand and may resent. Before acting, however, I realize that I am not doing my work as a personal matter but am acting for another, and therefore the words of the worker are not directed to me, no matter what he may say. They are simply directed at what I stand for. He may also be lacking in understanding of his status, so that I am not warranted in getting mad and losing my temper.

It seems that the only man in the establishment who is warranted in resenting such an affront is the actual head of the business himself. I soon realize, however, that his resentment would not be the kind with which I am most familiar, if indicated at all, so that I soon find that I cannot justify failure to carry the responsibilities of my department on a strictly impersonal basis. It seems clear that there is no place in industrial troubles for personalities and that I should not under any circumstances waste anger, but on the contrary should use it—not in the manner most familiar to us, however, but very carefully, considering it a precious working tool. I realize that my patience may be sorely tried, but that I must hold in mind that after all it is not my own patience that is being tried, but that of the enterprise, and therefore I am not warranted in letting my own personality lose control of itself and do something that I will be sorry for afterward.

In the analysis of my job I find that the old saying of "Whom the gods would destroy, they first make mad," is quite true, and as I do not wish to be destroyed, I decide that I will not lose control of my temper. I find that no matter how serious the situation may be, a cool head works out of it with the least difficulty, while the hot head blows up and soon occupies the status in the business comparable to the cypher with the ring rubbed out.

I Would Be a Salesman of Policy

I would remember that I am a salesman, and that my wares are the policy of the enterprise. I am endeavoring to sell this policy to the workers, in order that they may use it as one element in their job in turning out the product of the plant. I would keep the sales ideas uppermost in mind, knowing that it is better to get results from the other men when they are thoroughly "sold," than through a direct command without an explanation. Of course, I would not carry this to an extreme, but would point out to men the reasons why, as the first step and as an appeal to the best that is in them. I would realize that one of the largest parts of my job is human relations, and would be on the alert for new ideas that would assist me in securing better results from those for whose activities I am responsible. If I am ever in doubt as to just how to proceed in dealing with another man, I would stop and think how a salesman would handle the situation if he were on the road and ran upon a similar condition. I would then endeavor to apply the sales idea to my own situation, holding in mind that it is of little avail to "sell" a man in the first instance, without regard to future relations. I would endeavor so to handle the transaction that we would continue to do business for years to come and would consider that the selling of the article was an incident; that I was primarily out to establish a connection

which would be of mutual benefit over a long period of time. I would endeavor to hold in mind that sales are consummated because two parties agree upon a certain thing and in the right spirit. I would then find that my dealings with those for whom I am responsible would be on a better basis, as I would have in mind not only today, this hour, but tomorrow, next week, next month, and years to come. After all, the world is large, and the particular problem of the moment plays a small part in it. There is no use in changing the destinies of two lives over some matter that may appear of tremendous importance at the moment, yet be only insignificant in the general scheme of things.

I Would Be Patient

I would consider that patience is indeed a virtue. My everyday experiences soon prove that where I am almost on the verge of expressing myself very forcibly upon an important question, and then do not do so, it would have been a great error to have done so, and that after all I profited personally by being patient and following another course. I would see that it is necessary for a man in a supervisory position to have a thick skin, into which the little things of everyday life will not penetrate. I would not let petty murmurings of disgruntled workers with fancied grievances worry me, but would endeavor to reform them from within, rather than force a change upon them from without.

I would consider an open mind one of my important attributes. The times indicate that we do business from day to day and that plans not successful in former years now accomplish tremendous improvements. I would realize that production is a problem of coordinating a larger number of objects and influences, and that a particular method which might have been a failure in former years might now fit in because of changed conditions. I would not try to run a six-figure business with three-figure methods.

I Would Study Materials, Machines and Labor

Knowing that times have changed, I would endeavor to keep informed on the market for materials used in my particular department, as well as with the labor market. As production in a large organization is very much a matter of coordination, I would devote the same study to the use of men and materials that I would to my position in the chain of production represented by the several departments through which the materials flow.

If I were in charge of a machine shop using highly skilled mechanics, and I observed that the labor markets were tightening up so far as my particular kind of men was concerned, I would immediately look into my training facilities, with a view of improving results secured from present force, and at the same time would analyze the jobs more carefully, with the view of not using an all-round machinist where a milling machine hand or some other machine operator would be sufficient. I would endeavor to hold in mind that the use of materials and labor is for the purpose of making money, remembering all the considerations that should surround it, and would carefully balance the market situation against my use of these two items.

I Would Study Production and Labor Turn-Over

Individual production would be another item that would receive my constant attention. I would consider it the direct cours toward departmental production. Each unit in the department must work efficiently if the department as one of the units in the factory is to be maintained in the leading position I would want to have it in.

Labor turn-over would be my constant study. I would realize that it costs large sums of money to find the right man in the first instance, still larger sums to train him to produce the results desired, and then, having reached the production stage, that I have an investment in him which cannot be wiped out without loss. I would be particularly watchful to see that men are so placed with relation to other workers that they could work harmoniously and thus avoid the many changes that result from trying to fuse together two personalities that will not fuse.

I would observe that planning ahead would reduce my labor turnover, and I would endeavor not to place the business in the position of having to lay a man off. Giving the employment office advance notice of a reduction in the schedule when releasing men, would enable them to place the men elsewhere, and, except in times of the most severe depression, to place men so that the enterprise would not lose the benefit of their experience in it up to that time. In this way I would do my part in creating a feeling among workers that the plant takes care of its people, and that it does not regard them as mere machines to be used when needed and discarded without feeling when the need becomes less acute. I would encourage the men under my supervision to give advance notice of any condition that might require them to be absent or to leave the department, knowing that with this advance notice I can plan to cover myself in a manner that will not interrupt production and thus reflect unfavorably upon my work.

I would have a careful record of the time lost by persons on direct production kept and discuss the reasons with the individuals concerned when it appeared necessary, in an effort to improve matters.

I Would Take Care of the Men Under Me

I would not jeopardize the life or health of the men in my charge by allowing unsafe practices. I would realize that while there are certain hazards natural to every kind of business or manufacturing enterprise, I would not be doing my duty to my men or to the company if I do not strive to eliminate all unnecessary hazards. The safe way would be the best for me, compatible, of course, with production. I would use all my efforts to help the safety service work—the prevention of accidents—and would strive to impress on every one of my men the importance of safety first, last, and always.

Slight injuries would have my immediate attention. I would realize that hospital treatment is much better than any first-aid I might attempt, and I would insist on an injured employee reporting to the doctor at once. Infection would not be allowed to keep my men from work on account of neglected treatment, as I know that a very small injury can soon develop into a formidable one if not taken care of. I would try to use the "ounce of prevention," which I know is so much more valuable than "the pound of cure;" but those slight injuries which I cannot prevent would receive the best and quickest medical assistance available. A healthy crew is usually a happy one and is certainly more efficient than an unhealthy one. I would therefore feel it my duty to look after the physical welfare of my men as far as consistent.

I Would Develop Men

I would watch my working force and always be on the alert for unusual workers. I would see that from the standpoint of the business as a whole it is tremendously important to hold forth all possible incentives to employees, and would appreciate that promotion is one of the greatest incentives that can be offered anyone. Having that in mind, I would not object to the transfer of excellent men, but would rather pride myself on my ability to develop good men and would try to be in the position of always having material for better positions ready when the opportunity presented itself. I would consider developing men one of the most pleasant features of my work, and would take great pleasure in seeing those at work under my supervision passed on to more important work.

I would be an optimist. I would endeavor to develop the feeling of individual responsibility as generally as possible rather than center it entirely on my shoulders. I would appeal to the pride of men and women to get results and would

go very slowly on severe criticism of mistakes, but very strongly on appreciation of, and enthusiasm for, good work. When someone under my supervision did something in an unusual manner, or established a record, I would see that it became known generally.

One of the other general considerations that would receive my careful attention would be the various reports or paper work necessary to "tie in" my particular department with the main activities of the business. I would realize that the only reason I make a requisition on a separate department, is that the business is large enough to warrant having a specialist in that department, and that he is simply acting for me in taking care of the material in question. I would appreciate that the stock keeper cannot act with the greatest degree of intelligence and with the best results unless I do my part. I would therefore see that all of my requisitions were carefully filled out, and that the specifications were sufficiently complete, so that I would clearly understand them if I were in his position. So far as accounts were concerned, I would endeavor to make reports that would be prompt, complete, and accurate, so that the information might come back to me in concentrated form and with due relation to the other factors in the business.

I Would Concentrate on Production

After carefully considering the foregoing general considerations, I would then devote myself to a study of the specific duties of a foreman. By analyzing the subject, I would see that they would hinge mainly around securing definite results from the work of others, and would therefore come within two main classes: 1. Instruction; 2. Supervision. I would see that to secure the results the business requires, my main job is production, and I would forget how business was conducted in former years, would let the purchasing agent do the purchasing, the storekeeper the storing, and the employment man the employing.

Instruction

So far as instruction is concerned, if the enterprise had a training room, I would be glad to delegate that responsibility to those in charge of the training room; making certain, however, that the worker sent to me has been properly trained for my work, and that any further training necessary to make a skilled operator on my particular job is given in my own organization. In other words, I would realize the difference between actual training and adjusting to the work of my department.

Having no training department, I would feel it to be my duty to take the burden of instruction in my department on my own shoulders. An untrained worker would be my responsibility,—my "fault." The new employee would be my particular charge, and it would be essential that I take special pains to see that he felt at home, that he knew where to go, what to do and how. Knowing that more than three-quarters of our labor turnover occurred among those in our employ a month or less, my efforts would be concentrated toward "selling" the job and the business to this class of employee.

I would make certain that every worker understood the part his particular job plays in the finished product of the plant. If it were the manufacture of soap, and he were on the cutting operation, I would show him just how important his work was in producing bars of the right size, unmarred by careless handling. I would show him how delay in his work would slow up the whole section of the plant devoted to soap production; but I would make it clear that quality and accuracy came first, speed next.

I would see that my instruction extended further than the actual work on which the person was engaged, and that it covered the method of reaching the department, what to do in case of fire, and all the other little details outside of actual production that go to make one feel at home and a part of the department. I would particularly hold before me the thought that the first few days or weeks in the department is the most trying time for a worker, and would give him special thought and attention during that period, with the idea of helping him over the "rough spots."

Supervision

Having instructed him, I would then come to the question of supervision, and would realize that the main elements in supervision are covered by the following four operations:

1. Plan and schedule.
2. Execute.
3. Measure.
4. Reward.

Only by careful planning and holding to a well planned schedule can the work of my department go forward without delays. I would realize that no matter how small my department may be, it has a definite and relatively important place in the scheme of things; that it would not be there if this were not so. It would be a point of pride with me to see to it that production was not halted by breaking down or repairs necessary to my part of the industrial machine. Only by planning and setting up a schedule based on known factors, and limited or expanded by ever changing experience, can I hope to keep my department running steadily and to the best advantage of the business as a whole.

Living up to my schedule, executing would be my next endeavor. I am judged by my production in a great measure (though not wholly), and as a foreman I would be indeed a failure if I could not measure up to the demands of the business on which my own schedule is based. In securing efficient execution of the work in hand, I would endeavor to "keep my fingers on the pulse of my department," watching particularly those points where trouble is most apt to occur. If my working force were large I would request authority to appoint a sufficient number of assistants, so that supervision would be beyond reproach, realizing that the average American industry today is over-equipped and under-supervised.

The measurement of the work done in my department—accurate checking, records, and accounts and an adequate wage scale for my men as their reward, would be considered as prime factors in my foremanship: and in so far as I am able I would strive to be both accurate in reports and just in asking monetary consideration for effort expended.

Finally, I would keep these two words:

1. Instruct
2. Supervise

before me constantly as making up the "big idea."

There are probably many other things, not enumerated herein, that I should do, were I a foreman. But I will not go far wrong, in any case, if I were acting for another and should therefore do what he would do.

Combining for Foreign Trade

Combining under the Webb law to meet the intense and highly organized competition of foreign organizations, more than one hundred American organizations in the last year have filed their papers with the Federal Trade Commission, according to a summary just made by the Guaranty Trust Company of New York in its new booklet, "Combining for Foreign Trade."

Not only the most powerful selling combinations in the world, such as the electrical and dye-stuffs combinations in Germany, and the famous Cambrian coal combine of Great Britain, have worked against them in competitive markets, but large foreign buying combinations have helped to depress American export prices, by making individual American producers bid against each other. "It is obvious," says the Guaranty Trust Company, "that the only way in which to meet collective buying effectively is by collective selling." Yet, as it points out, "there is no 'rule of three' by which any selling organization for export trade can be put together. The domestic problems of each industry have to be analyzed first, and the conditions of manufacture studied."

Chrysil, a New Rubber from Rabbit-brush*

By Harvey M. Hall and Thomas H. Goodspeed

Department of Botany, University of California

Microscopical examinations of *Chrysothamnus* and related genera were at first undertaken as a short cut method of determining whether or not a given sample of shrub contained rubber. In addition we have attempted, with some success, to employ the microscopical method for estimating the relative amounts of rubber in the different samples. At the beginning of the investigations we were forced to rely upon this method almost entirely since facilities could not be secured for making ourselves the many chemical analyses which have since been carried through. Chemical analysis is, of course, the only method of making both the original determination and of obtaining an estimate of rubber present which is at once thoroughly dependable and really significant.

The microscopical method, in brief, consists in cutting off cross sections of a mature portion of the sample and the making therefrom, after the action of suitable solvents, stains and mounting media, of a preparation in which the rubber, if present, may be seen under the microscope. As will be shown in the detailed description given below, the process of making such a preparation is simple and may be sufficiently well controlled to yield results that will be fairly uniform and reliable.

As in Guayule, the rubber in *Chrysothamnus* and *Haplopappus* is present within the individual cells of the plant, and is not a latex rubber. Like Guayule again it is found principally in the parenchymatous elements of the cortex; indeed it may occur in any undifferentiated elements lying without the cambium or, in other words, in what is often spoken of as the "soft" or "inner bark." It may also be noted here that rubber does not appear to be laid down during the first year of growth of a tissue and indeed, unless present in large amount, is not readily detected by the histological method in portions of the plant less than three or four years old. A section of a plant taken slightly above the soil line will exhibit tissues containing practically maximum quantities of rubber. In investigating new and untried species by the microscopical method it is wise to make sections from well down the root as well as at the soil line. This is indicated by our results on *Haplopappus* mentioned on the third part of this article. In certain species of that genus practically no rubber was found in sections of stem tissue, while quite appreciable amounts were shown in sections taken well down the main root. We have found in *Chrysothamnus* that maximum quantities are borne by the stem, although for a limited distance below the soil line the root may bear an almost equivalent amount.

In selecting and removing the material to be sectioned care must be exercised to retain the bark. This is often difficult, as the dry corky tissues readily split off, together with the living cortex, along the delicate cambium region, from the hard, woody cylinder. When the tissues are stripped off in this way it is useless to attempt the cutting of sections, since practically the entire rubber-bearing cortical area will be missing. It has been our practice to cut out the desired piece of mature woody tissue and allow it to soak in water for twenty-four hours before sectioning. This treatment softens all the tissues and renders more simple the handling of the important barky elements. The actual cross sections are made with a section knife or heavy-backed razor not hollow ground. The piece of material may be held in the fingers for cutting or in a so-called hand or well microtome. One of us has devised a modification of this type of microtome which was used in these investigations.[1] A sliding microtome has also been used. Successful sections can be cut only with an extremely sharp instrument and only a few sections can be cut before sharpening must be repeated. Smoothing the surface to be cut with a sharp pocket knife is desirable and saves for a time the finer edge of the sectioning razor. If interest centers entirely upon the question of the presence or absence of rubber, it is not essential that the sections cut be particularly thin nor that they be taken exactly at right angles to the long axis of the sample. In our work details of structure and other matters were often of special importance for which reason all sections were cut less than 50″ in thickness and were carefully oriented.

A Large Plant of *Chrysothamnus Nauseosus* Variety *Viridulus*

As noted by Lloyd[2] rubber when present in large amount is, after some practise, rather readily detected in fresh or unstained sections of non-latex rubber plants. When present in smaller quantities it is often indistinguishable from the protoplasmic matrix of the cell or is confused with accumulations of oil or resin in the tissues. According to our histological method oils and resins were dissolved out because of the relatively small amount of rubber usually present and especially as preliminary to the use of a stain which was not definitive for rubber in the presence of these other substances.

* Continued from December 10, 1919, issue.

[1] Goodspeed, T. H., Modification of hand microtome. Bot. Gaz., vol. 66 (1918), p. 534.

[2] Lloyd, F. E., Guayule. Carnegie Inst. Publ. no. 139 (1911), p. 176.

As a solvent, acetone was used exclusively, the sections being placed in a test tube half full of acetone and allowed to stand in a water bath at 60° C. for from fifteen to thirty minutes. For staining the sections we at first tried alkanin,[3] but Sudan III was early found to be more satisfactory and was therefore employed in the great majority of the histological examinations. Our Sudan III was made up with glycerine according to Stevens' formula.[4] This stain imparts a brilliant scarlet color to fats, resins and rubbers as they occur in the cell. By the previous acetone extraction fats and resins had been dissolved from the cell contents, but rubber was left practically unaffected, and if present took up the stain. The stain was allowed to act for eighteen hours, after which the excess was washed from the sections with 50 per cent alcohol. The sections were then mounted in glycerine, and in some cases were ringed.

Search for Staining Method

Some search has been made for a staining method which would be strictly definitive for rubber, and which would result in importing such a characteristic color to the rubber cell-inclusions as would serve to distinguish them definitely from all other inclusions. The desirability of securing such a staining method is seen in the fact noted above, that alkanin and Sudan III are in histological practice used to indicate the presence of resins and fats, respectively, and thus their ability to stain rubber in the cell is in a sense more or less fortuitous. The fact that alkalin is a specific stain for resins might suggest a corresponding staining reaction in the case of rubber. As far as Sudan III is concerned, however, we are employing a stain used in animal histology to give definition to globules of fat occurring in the cell. Without going into the question of the chemistry and differential staining of the fats, fatty acids, and lipoids, it may be noted that the staining of fat globules by Sudan III is taken to indicate that this stain is soluble in the contents of the fat globule whereas it is not soluble in the other constituents of the cell which, therefore, remain unstained. It is somewhat difficult with this explanation of the characteristic staining reaction of Sudan III in mind, to understand its action in the case of rubber. This matter is mentioned simply to call attention to the possible theoretical interest attached to the problem of the staining of rubber inclusions in the cell.

We have further been interested in this matter because cell inclusions have been consistently found in chlorophyllous tissue of both stems and leaves which, with Sudan III, stained as rubber, but which were difficult to differentiate with this stain from the residue of the protoplast with its included chloroplasts, which does not in such tissue entirely disappear after acetone extraction and which stains to some extent with Sudan III. In this connection it should be stated that in other tissues also it is difficult to distinguish between the protoplasmic matrices of the cells which may be stained with Sudan III, and the rubber inclusions which may or may not be present. Thus in the tables which follow it is in some cases possible that the plants which on the basis of "microscopical examination" are stated to contain "traces" of rubber may have shown only stained cell inclusions which could not positively be identified as rubber.

Staining Combinations Attempted

We have made some preliminary investigation of the effects of a variety of stains. A number of staining combinations were attempted, especially in the case of sections involving chlorophyllous tissue, to stain the protoplasmic matrix of the cell and follow with Sudan III. It appears that a heavy staining with Orange G. followed by Sudan III may be a useful combination in this connection. Of a number of stains ordinarily employed for the differentiation of the elements of woody tissue one at least gave some indication of being of interest. Sections were placed in Delafield's hæmatoxylin for twelve hours, partially destained and placed over night in Sudan III. In the resulting preparation the rubber inclusions were stained scarlet by Sudan III, while in the center of each was a single spot of dark purple indicating, apparently, that each rubber globule contains a protoplasmic "nucleus" around which it is built up. Results of this sort indicate a field for further investigation.

It occurred to us, also, that vulcanization of the rubber *in situ* might be possible, and thus giving specific differentiation under the miscroscope to rubber inclusions in the cell. After suitable dehydration, sections were placed in the cold in sulfur chloride (in carbon tetracholoride), or were allowed to stand in the fumes of such a solution. The results of a number of preliminary experiments indicated that vulcanization of the rubber inclusions in the cells was possible.

The following outline of the process of making preparations of rubber-containing tissue described in some detail above may be of assistance to those who may desire to make histological examinations for a similar purpose. Attention must be called to the fact that nothing original is claimed for this process, nor will it necessarily prove successful in all its details for other species.

It is assumed that a woody plant is under investigation, and that sections have been cut from a sample of mature tissue.

(1) Sections from water to 95 per cent alcohol; 5 minutes.

(2) Boiling acetone; 15 to 30 minutes.

(3) Sudan III; 18 hours.

(4) Wash off excess of stain in 50 per cent alcohol; as rapidly as possible.

(5) Mount in pure glycerine.

Results Obtained

A preparation made in this manner from material cut from a relatively high percentage plant of *Chrysothamnus nauseosus* will show cell inclusions of rubber stained a brilliant scarlet. At a magnification of 150 diameters the parenchymatous elements of the cortex, and especially the broad wedge-shaped cortical extensions of the primary rays will appear to be solidly filled with stainable material. In the younger corky layers of the inner bark stainable cell inclusions will probably be numerous. Nearer the periphery a tissue which is often intensely stained will usually be found, with greater magnification, to consist largely of much crushed bark cells the suberized walls of which take up the stain readily. Within the cell the rubber occurs in globular form or in a more or less diffused state filling the entire cell cavity. The globules may be large, one or two to a cell, or small and numerous in each cell. Only this brief description will be made here of the appearance of a typical preparation made according to the process detailed above.

As mentioned in an earlier paragraph, we have attempted with some success to use the microscopical method for estimating the relative amounts of rubber in the various samples examined. A purely arbitrary scale of values was adopted, and relative rubber content determined in each case by comparison with other preparations selected as representing high, low, and medium rubber content. For such comparisons a comparison-ocular was found to be useful. Uniformity and artificial light was therefore used throughout. As soon as it became possible to obtain large numbers of chemical analyses, the histological method of estimation became largely superfluous. However, in almost all cases it was resorted to prior to the chemical analysis and a rough estimate made. Often when the rubber content of a sample appeared to be quite low no chemical analysis was made, and a considerable amount of time and labor was thus saved. Throughout the investigation we continued to examine microscopically numbers of samples of doubtfully valuable species which were suspected by others of containing rubber, or which were collected by ourselves in order that no possible source of rubber accessible to us should be overlooked.

[3] C. F. Stevens, W. C., Plant anatomy, 3d ed. (1916), p. 293.
[4] L. c., p. 337.

Controlling Shapers on Cord Tire-Making Machines

This invention relates to an improved mechanism for controlling the position of the shapers of fabric forming discs employed on tire-making machines.

In the best known types of tire-making machines now in commercial use, the fabric tire carcasses are built up on an iron core through the winding of the strips or sheets of fabric on the core and the subsequent stretching or arranging of the edge portions of the fabric to bring the threads thereof in proper position on the core.

This shaping of the fabric about the core is ordinarily referred to as "stitching" and is accomplished by a pair of revoluble forming discs called "stitchers," pivotally mounted on a carriage slidably mounted for advancement toward or retraction from the core.

The discs (afterwards referred to as shapers) are spaced a sufficient distance to allow the crown of the core to be received between them when the forming operation is started and are held against the surface of the core either by the operator or through the use of a spring or its equivalent. The core is rapidly rotated while the shaping operation is going on, and as the core rotates the shapers are gradually moved in on the core toward the axis of the core, whereby a series of circumferential convolutions are scribed by the shaper against the side of the core, with the result that the fabric is gradually formed down on the core.

In the manufacture of cord tires the difference in the type of fabric employed to build up a carcass requires considerable variation in the use and operation of the shapers.

In a fabric tire the fabric plies employed are woven with weft and warp threads which cross each other at right angles and are interlocked in the usual manner.

However, the fabric employed to build up a cord tire consists only of relatively large cords which run parallel to each other and are unconnected to each other except for a temporary union which is obtained by the use of a very light weft thread, designed only to hold the cord elements in pro-

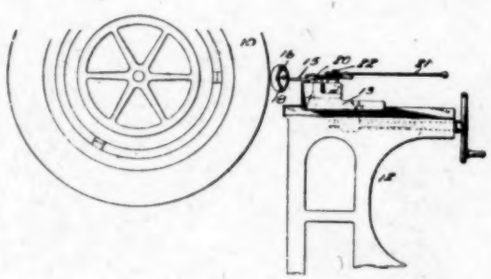


FIG. 1

per fabricated relation to each other until after the tire carcass is built up and vulcanized. As soon as the tire is placed in the mold the light cross weave cords are broken through the expansion which occurs in the curing.

In view of the fact that this cord fabric is cut on the bias before the plies are laid on to the core, it is obvious that the cords will run across the crown and down the side walls of the core at an angle (which in practice is usually an approximate angle of 45 degrees), to the circumferential centre line thereof.

In the building of an ordinary fabric tire on a core the warp and weft threads are of the same size and closely interwoven to give the fabric a strong unity, and the threads or cords in the fabric are at an angle opposing the progression of the shapers around the core and are thereby held against undue displacement or distortion through action of the shapers. In the case of the fabric employed to build up a cord tire, on the other hand, the cords forming the fabric all run in one direction, and therefore one shaper running on one side of the core will be progressing around the core in the direction following the lines of the cords, but the other shaper on the opposite side will be running in direct opposition to the lay of the cords and will, therefore, tend to buckle and roll them up from the side of the core.

It is, therefore, impracticable in laying down upon the core the fabric for making a cord tire, to simultaneously employ the two shapers, one on each side of the core. Such being the case, it is advantageous to be able to provide a shaping unit

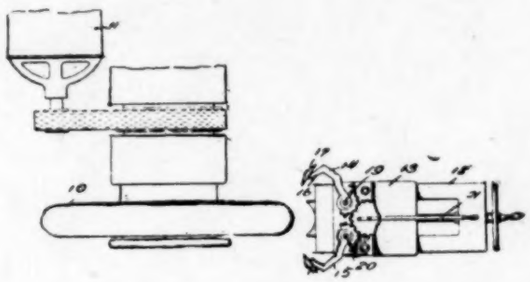


FIG. 2

for tire-building machines so constructed that the two shapers may be operated by a machine operator in such a manner that when one shaper is brought into engagement with one side of the core, the other shaper is automatically moved into its inoperative position. This is done by the invention, which also provides mechanism of this character with a reversible drive for a core so that the core may at will be driven in either direction according to which shaper is employed, to insure that the shaper in service will progress around the tire in the direction of the lines followed by the cords of the ply of fabric which is being applied.

Fig. 1 is a front elevation of a tire-making machine showing the improved device mounted thereon;

Fig. 2 is a top plan view of the same;

Fig. 3 is a diagrammatic view illustrating the action of one of the shapers; and

Fig. 4 is a diagrammatic view illustrating the action of the other shaper.

The improved shaper and the reversible drive for the core is not limited to use in connection with a tire-making machine of the type illustrated, but may be used in connection with any other tire-making machine of a modified type which embodies the essential elements of a driven core and a shaping mechanism.

In Fig. 1 the numeral 10 designates a revoluble core driven through a suitable connection by a motor 11, the driving mechanism being so arranged as to permit of reversing the direction of rotation of the core at will, as, for example, by reversal of the electric motor shown.

The shaping unit comprises a base 12 upon which is slidably mounted for reciprocation toward or away from the core, a slide or carriage 13. Upon the forward end of the slide or carriage 13 are pivoted a pair of shaper supporting arms 14 and 15, to the free and forward end of which are revolubly secured by an axle 16, a pair of shaper discs 17 and 18 of the usual conformation.

The pivots 19 and 20, which secure the shaper arms upon the carriage, are preferably disposed at the rear ends of the arms as in Fig. 1. On the rear end of these arms are an integrally-formed segmental series of rack teeth which are disposed to engage with a segmental series of rack teeth on the

end of control lever 21. This lever is pivoted as at 22 on the top of carriage and is so located that it may be conveniently manipulated by the operator and swung either to the right or to the left to turn the shaper arms upon their pivots.

It will be noted in Fig. 2 that the rack teeth of the two shapers are so meshed with the rack teeth of the control lever that a movement of the lever to engage one of the shapers with one side of the core will be automatically accompanied by the swinging of the other shaper arm in a manner to swing the shaper roll thereon into a spaced and hence inoperative relation to the core.

In Fig. 3 it will be seen that the shaper 17 may be swung into engagement with the side of the tire and the driving connection between the motor and the core set to drive the core

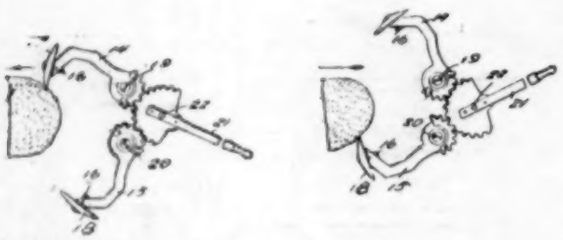


FIG. 3 AND FIG. 4

in the direction of the arrow. With this arrangement of the mechanism the shaper may move circumferentially around the tire and regularly across the side thereof toward the centre of the core without disturbing the lay of the cords, inasmuch as it will be following the lines of direction which the cords will naturally assume and in which they have initially been laid.

To stretch the cords on the opposite side, however, as in Fig. 4, which cords run in reversed direction with respect to the shaper 18, it is necessary to reverse the direction of the drive of the motor and swing the shaper 18 into engagement. The operation of the machine in this latter manner will ensure proper shaping down of the other side of the fabric ply.—No. 125,071, Goodyear Tire and Rubber Company, Akron, Ohio, U. S. A.

Public Holidays in March

The following calendar of bank and public holidays, which will be celebrated in March in the states and countries and on the dates enumerated below, and which is of considerable interest to exporters, is furnished by the Guaranty Trust Company of New York:

Monday, March 1—Queensland (St. David's Day), Salvador.

Tuesday, March 2—India. In the United States: Texas (Texas Flag Day).

Thursday, March 4—Bulgaria.

Saturday, March 6—Brazil (State of Pernambuco).

Thursday, March 11 (Anniversary of the Revolution)—A holiday in Don Republic, North Russia, South Russia, Soviet Republic, Siberia, Ukrainia and all other parts of the former Russian Empire.

Friday, March 12—In the United States, New Mexico (Arbor Day).

Monday, March 15—Salvador (National holiday, but not observed by banks).

Wednesday, March 17 (St. Patrick's Day)—A holiday in Newfoundland, New Zealand, Queensland, United Kingdom (Ireland).

Friday, March 19—Brazil (State of Rio Grande de Norte), Dutch East Indies. A holiday (St. Joseph's Day) in Argentina, Costa Rico, Guatemala, Mexico, Peru.

Sunday, March 21—India, Japan (Spring Festival).

Monday, March 22—Porto Rico (Emancipation Day). In the United States: South Dakota.

Tuesday, March 23—Egypt, New Zealand (Otaga and Southland).

Thursday, March 25 (Annunciation Day)—A holiday in Austria, Brazil, Finland, Germany, Hungary, Malta, Poland, Sweden.

Tuesday, March 30—Alaska (Seward Day).

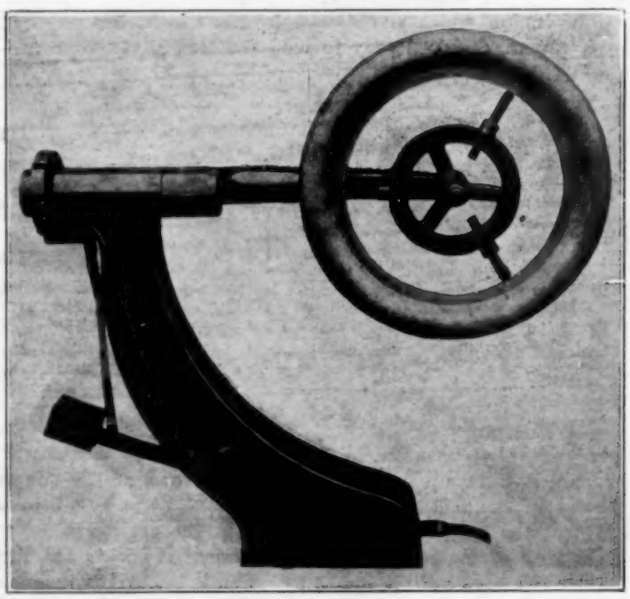
Wednesday, March 31—Nicaragua.

Improved Tire Building Stands

The Pechstein Iron Works, of Keokuk, Iowa, have designed tire building stands which embody numerous novel features. The stands in question are known as S4 and SC, and are identical in construction with one exception: in model S4 the ratchet holding the arm in position is worked by the foot, while in model SC it is worked by hand.

Among the points of construction worth noticing is the fact that the spider revolves on a turned shaft riveted into the arm and has three adjusting screws having case hardened points, capable of handling cores for any sized tire from 28 inches to 44 inches in diameter. The ratchet catch on the spider is reversible and enables the operator to work on either side, and in addition it can be thrown out to permit free turning of the spider and core. The arm is of cast iron with a 2½ inch cold-rolled shaft cast into it. It is balanced in a manner making manipulation easy and turns in a babbitted bearing which eliminates the use of roller bearings. The arm ratchet is extra heavy cast iron and on the S4 model is attached to the arm shaft with set screws while on the S C model it is cast as part of the arm.

The lever system on model S 4 is made of bar steel and is counter balanced with a weight which eliminates the use of



PECHSTEIN TIRE BUILDING STAND

springs. The foot lever on this model can be readily changed from the right to the left side by reversing the connecting rod and attaching the foot lever to the lug on the opposite side of the stand.

Both of these models were designed at the request of a prominent tire factory and are constructed in such a manner as to endure the roughest treatment. Model S 4 weighs 450 pounds while model S C weighs 435 pounds.

World's Rubber Production Increases

Annual Consumption of Rubber in United States Reaches 350,000 Tons—Increasing Number of Automobiles Make Heavy Demands Upon Supply—Statistics for Past Decade

The manufacture of rubber products, which in 1919 became a billion-dollar industry in the United States alone, is consuming rubber at the annual rate of 350,000 tons.

To meet a tremendous cumulative demand there has been a great increase in the production of plantation rubber, as indicated by the following figures furnished by the Firestone Tire and Rubber Company, at Akron, Ohio:

Year.	Plantation.	Other sources.	Total tons.
1909	3,600	62,000	69,600
1910	8,200	62,300	70,500
1911	14,419	60,730	75,149
1912	28,518	70,410	98,928
1913	47,618	60,822	108,440
1914	71,380	49,000	120,380
1915	107,867	50,835	158,702
1916	152,650	48,948	201,598
1917	213,070	52,628	265,698
1918	255,950	40,629	296,579

Up to about eight years ago, as is seen by this table, there was little stability to the source of supply, because the world was largely dependent on the gatherings of wild rubber from the jungle trees of Brazil, Mexico and the Congo. Then, thanks to the foresight of an English traveler, who brought rubber tree seeds from South America and interested his government in experimenting with plantations in India, rubber production began to multiply rapidly and manufacturers could rely on a sure, stable supply.

While the source of supply is largely British, the center of the cultivated rubber supply being in Singapore, Straits Settlements, the United States is the nation manufacturing and consuming most of the world's supply of rubber today.

Over 75 per cent of the rubber produced goes into tire equipment for motor vehicles.

The production of tires in this country has practically trebled in the last five years. The opportunity for much greater development is clear.

There are 7,600,000 passenger cars and motor trucks running now. Official estimates of the industry place the production of passenger cars during the forthcoming twelve months between 300,000 and 350,000, and the production of trucks at 375,000 to 450,000, depending upon the condition of foreign credits.

The problem of the manufacturer up to now has been one largely of production. The public is buying cars as fast as it can get them. There has been no forcing of sales, and no whetting of the appetite for cars has been necessary. The most conservative feel that this will be true up to the point of 12,000,000 cars, allowing that six years is the average life of a car.

Twelve million cars running would mean 72,000,000 tires, at the rate tires are used now, the present figures showing that an average of six tires a year are used by a car owner.

In contemplating the expansion of truck tire business, it is hard to be conservative enough to sound conservative. The world has just recently awakened, in reality, to the value of the truck as a factor of transportation and distribution. The place taken by the truck during the war occasioned this awakening. But people at large are not fully conscious, yet that the truck is destined to be as potent a factor in the regime of peace as in war activities.

As the passenger car has made all points accessible to the people, so is the truck opening a market for all products, wherever developed. To add, then, to the passenger car demand for tires this tremendous truck tire demand, makes the rubber industry assume proportions of the first magnitude.

Our Cleveland Office

For the greater convenience of the friends and patrons of THE RUBBER AGE AND TIRE NEWS and TIRE TRADE JOURNAL, The Gardner-Moffat Co., Inc., takes pleasure in announcing the establishment of a Cleveland office, in charge of F. H. Van Horn. Communications addressed to Mr. Van Horn, 828 The National City Building, will receive his prompt and careful attention.

Goodrich Business Grows

A reflection of the big business which the rubber companies did during 1919 through the great degree of activity in the automobile industry is shown in the annual report of the B. F. Goodrich Company for last year. The net sales of $141,343,419 are the largest in its history, comparing with $123,470,187 in 1918, and $87,155,072 in 1917.

The increased costs of manufacturing, however, bring the balance after this is deducted, below the 1918 figure. The total income of the company was $20,340,214, as compared with $21,610,322 in 1918. The income last year was practically double that of 1916. After depreciation and similar charges, but before Federal taxes, the net profit available for dividends was $17,304,813, which was equivalent with preferred dividends deducted to $25.09 a share on the $60,000,000 common stock. In 1918 the earnings on the common were $23.08 a share.

Details of the proposed recapitalization plan for the company are set forth in a letter to the stockholders, who will vote on the question at a meeting March 10. The plan provides for the issuing of $30,000,000 five-year 7 per cent convertible gold notes, which are convertable into common stock at 80. It is further provided to increase the capitalization from 600,000 shares of $100 par value to $1,500,000 shares of no par value. Of the new shares 600,000 will be exchanged share for share for the present outstanding common; 125,000 shares will be open to subscription by Goodrich employes, and 375,000 shares will be reserved for conversion of the proposed 7 per cent notes. The remaining 400,000 shares will be held in the treasury for the future requirements of the company.

Columbia Increases Stock

Business and trade conditions of the present time show signs of progress and advancement in many lines of effort and enterprise, and in many instances there may be seen evidences of increasing success and prosperity on the part of a number of concerns actively and prominently identified with the development and upbuilding of the general commercial and industrial interests and welfare. In this connection special mention may be made of the recent action on the part of the Columbia Tire and Rubber Company, located at Columbiana, Ohio, in authorizing the increase in the company's capital stock to $2,000,000.

The increase of the company's business demanded a 100 per cent increase in production capacity. To accomplish this, the increase of capital was authorized by the directors and stockholders, with the result that the chamber of commerce of the city of Mansfield, Ohio, prevailed on the directors to build an additional plant of the Columbia Tire and Rubber Company and locate same in Mansfield, Ohio. In lieu of this concession the Mansfield chamber of commerce disposed of the entire new stock issue without solicitation or commission to the banks and business people of Mansfield in less than three days time.

The new plant is now under construction and will be modern in every detail, and will be known as Mansfield Division, Plant No. 1, and the present plant as Columbiana Division, Plant No. 2. Plant No. 1 will be devoted to the production of super-cord tires and automobile inner tubes, thus allowing Plant No. 2 to increase their production of fabric tires.

As soon as the new plant is completed the general offices of the Columbia Tire and Rubber Company will be located in Mansfield, Ohio, but both factory organizations will be held intact.

With the wonderful shipping facilities of Mansfield, Ohio, located as it is with three trunk line railroads passing through the city, it means service to the patrons of this company. It will readily be recognized and appreciated that this action on the part of the management will not only have the effect of materially enlarging the present scope and activities of the enterprise, but will at the same time impart elements of greater financial strength and stability placing the company in a position for enhancing its usefulness.

Fort Wayne Begins Production

The Fort Wayne Tire and Rubber Manufacturing Company, Fort Wayne, Ind., has begun operation.

The machinery equipment is practically complete with every man employed a skilled worker in his line. The plant began operation last week and started off by manufacturing two hundred inner tubes daily. Later on the management expects to increase this number and to begin the manufacture of outer tubes.

On the first floor is the mill room, the compounding room, machine shop, boiler room and heavy-storage room. In the basement the rubber is stored in addition to the washing machinery. The second floor furnishes space for the shop, lavatories, experiment stations and business service equipment. The tube room, rubber dryer and light stores are located on the third floor of the building.

From now on no time will be lost in getting the output of the plant up to the maximum. The company expects a large business this season and is beginning operation in time to be in shape to supply the demands of the summer.

Ajax Business for 1919

The Ajax Rubber Company, Inc., New York City, showed a considerable increase in business for 1919 over the previous year according to the annual report of the company for the year ending December 31, 1919, which has been recently issued. According to the report there was a fifteen per cent increase in sales over 1918 while the earning power of the company increase approximately twenty-nine per cent. Net profits for the year, after deductions had been made for taxes, were $2,201,267, as compared with $1,215,368. Sales, less discount, freight and allowances, amounted to $22,189,002 as compared to $19,297,721 for 1918.

It was also stated that the company intends to double its capital stock. With this in mind a stockholder's meeting will be held on February 24 to decide upon the proposal to increase the authorized stock from $10,000,000, consisting of 200,000 shares of $50 each, to $20,000,000 to consist of 400,000 shares of $50 par value each. It is stated that this stock is to be regarded as a reserve for possible future needs.

As contrasted against the sales of $22,189,00- there were costs and depreciation of plants and equipment to the extent of $15,962,760. Other expenses combined to reduce the net profits, before taxes, to $2,951,267. Taxes at approximately $750,000 reduced this to $2,201,267. In 1918 the sales were $19,297,721 and gave before taxes a net profit of $2,915,368.

In 1919 stockholders were paid $1,032,627 in dividends. Following the deduction for all charges the year's surplus was $1,168,640, an increase of $805,272 which when added to the surplus as at January 1, 1919 makes a surplus at the beginning of 1920 of $2,128,849. Capital assets on the 1919 report total $4,509,910, a gain over the previous year when the assets totaled $4,034,823. Current assets, $11,054,704 were far larger than the previous year when they amounted to $6,924,240. Deferred charges at the close of 1919 were $86,061, compared to $112,571 on the former report.

Quality Tire Expands

Announcement was made recently that the Quality Tire and Rubber Company, of Anderson, Ind., had purchased and is taking over the Long Wear Rubber Company of Elyria, Ohio. The purchase includes the buildings and machinery of the Long Wear Rubber Company, and the trade mark and name of the Elyria firm, which is established over the entire country, and is widely and favorably known. Several hundred thousands of dollars were involved in the transaction.

The Quality Tire and Rubber Company will manufacture Anderson quality tires and also will make the Long Wear brand.

The Quality company is bringing fabric equipment machinery from the Long Wear plant at Elyria, which is being installed in the Quality Tire buildings. With the new machinery installed, the local factory will be able to turn out 500 tires a day.

Diamond Holdfast to Build

Work will be started upon March 1, it is stated, on a $300,000 plant of the Diamond Holdfast Rubber Company as another step to make Atlanta, Ga., a place of importance, as the rubber tire manufacturing center.

Contracts already have been let it is announced and a decision is to be made soon by officials of the company on the site, embracing forty-five acres. A half dozen suitable locations are under consideration.

The new structure will make possible an increase in production six times the present output of the company. It is intended also to prove that Atlanta's location is favorable to the tire industry and that Atlanta-made tires can be produced with less cost to the consumer than those from factories in other sections.

In planning the factory, provision has been made for the welfare of the employes. The building itself will be of the "Day-lite" order, supplying a maximum of light and ventilation, and in addition there will be a housing corporation to build homes of any sort desired by the workmen for which they will be permitted to pay in easy installment payments.

Grand Rapids Organized

With L. A. Brown as president and general manager, Merwin J. Goldner, secretary and treasurer, and H. H. Swan, production engineer, the Grand Rapids Tire and Rubber Corporation is being organized for the manufacture of cord tires and inner tubes. The company is capitalized at $1,000,000 preferred and 20,000 shares no par common stock. A considerable amount of the stock, it is stated, already has been subscribed.

The company is negotiating for the purchase of a twenty-four-acre factory site with 1,000 feet of railroad siding, and is having plans made for the buildings. It plans to build and put into operation one complete unit and then construct additional units as the business grows. The production will be high grade cord tires and pure gum inner tubes and it is expected 500 or more workers will be employed.

Fisk Business for 1919

The Fisk Rubber Company for the year ended December 31 experienced the most prosperous period in its history. Net earnings, after all charges and provisions for dividends on the first and second preferred stock, should approximate $4,000,000, equal to about $9 a share on the $10,859,500 outstanding common stock.

During the year the capitalization of the company was changed and no accurate estimate as to the asset value of the stock can be given at this time. The annual report of the company which is to be published shortly will show assets considerably increased from the previous year.

For the year ended December 31, 1918, the company showed net earnings after all charges of $2,506,853, which, after allowing for preferred dividends, was equal to 19.50 per cent on the common stock compared with $3,028,571, or 25.70 per cent, in the previous year.

Gammeter to Build

The W. F. Gammeter Company, of Cadiz, Ohio, has been recently incorporated with authorized capital of $100,000 to take over and enlarge the former individual business of W. F. Gammeter, maker of Universal steel calender stock shells and Universal tire machine drums. The new company will soon erect a foundry to produce their own malleable castings and are receiving estimates on a modern day light factory building 80 ft. x 240 ft. The management remains the same and with the additional factory space the company will be able to carry much larger stocks and insure prompt service.

Goodyear Sales Increase

The report of the Goodyear Tire and Rubber Company covering its operations for the year ended on October 31, 1919, issued recently shows that the company's sales for the year increased more than $168,900,000, compared with those of 1918, and also that net profits advanced nearly $8,000,000.

Total sales for the year, as shown in the report, were $168,914,983 against $131,247,382 in 1918 and net income subject to Federal taxes, $23,277,245, against $15,388,191. There was an unappropriated surplus of $33,332,666 at th end of the year.

The balance sheet at the close of the fiscal year showed current assets of $75,532,070 and current liabilities of $21,785,484, leaving working capital of $53,756,586. Dividends totalling $5,303,295 were paid during the year on capital stock at the rate of 7 per cent on the first preferred, 8 per cent on the second preferred and 12 per cent on the common.

In his remarks to stockholders, F. A. Seiberling, president of the company, said: "It is gratifying to be able to state that of the new issue of preferred stock offered to our stockholders and employes, $41,135,900 has been subscribed by 30,409 individuals, representing every state and territory in the Union, of which amount $7,843,600 was subscribed by 17,407 employees of the company."

It was announced that during the last year the directors had caused to be organized the Goodyear Tire and Rubber Company of California, of $20,000,000 capital, and the Pacific Cotton Mills Company, of $6,000,000 capital. Plants for these companies are being erected and when completed the rubber plant will have a capacity of 7,500 tires a day, and the cotton plant of 150,000 yards a week. The Goodyear Tire and Rubber Company of Ohio purchased all of the common stock issued by both companies in the amount of $5,000,000.

Columbus Plant Completed

The new factory building of brick and steel construction soon to be occupied by the Columbus Tire and Rubber Company at West Goodale street and Olentangy river, Columbus, Ohio, is practically complete and machinery is being placed. Much of it is already in and the entire equipment necessary to start production has arrived in the site nearest Goodale street, leaving ample space in the rear for additions to the factory as they become necessary and the construction is such that additions may be made with the minimum of inconvenience and expense.

The new plant is of saw tooth construction, two stories in height, with spacious basement. It covers 36,000 square feet of floor space. Many of its features of design and arrangement are similar to those of the Firestone factories in Akron which are said to be the best of their kind in the world. Although machinery is to be driven by electricity, two gigantic boilers are employed. They are automatically stoked and coal for them is dropped into the stokers direct from cars on track, saving all unnecessary handling of the fuel. The boilers will be used to generate steam to be used in making the company's products.

Columbus cord tires are to be manufactured. They will be hand-built and guaranteed for 15,000 miles. Tubes will also be made. The factory's output for the first eighteen months has been contracted for.

Personals of the Trade

Recent McGraw Promotions—Sherman with Industrial Salvage—Webster with D. and M.—Goodyear Promotions in New York—National Aniline Elects—Jackson with Firestone on Coast

Recent McGraw Promotions

W. H. Hurley has been appointed district manager of the McGraw Tire and Rubber Company for the eastern district, with headquarters at New York City. Mr. Hurley has been district manager in the west for the same company, with headquarters at Kansas City, Mo., and his transfer to the east is not only a promotion, but a high recognition of his managerial ability.

He has been connected with the automobile industry for a number of years, and has covered territory in all parts of the United States, which has given him a nation-wide experience.

B. P. Davis, formerly a McGraw salesman in southern territory, has been promoted from the ranks to the managership of the company's Memphis, Tenn., branch. In addition to spending the greater part of his life in Memphis, Mr. Davis has been closely connected with the tire industry in the south for several years.

E. T. Fischer has been made manager of the Denver branch of the company. For the past decade Mr. Fischer has been closely allied with the automotive industry in the central and western states, and previous to assuming charge of McGraw's interests in the Denver territory, represented the company in a sales capacity.

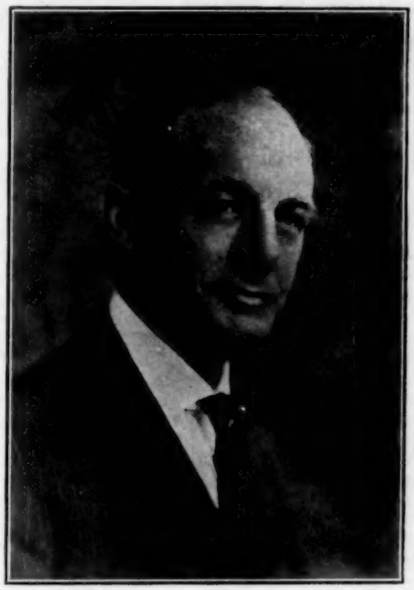
During the past year the McGraw Tire and Rubber Company has pursued a policy of conservatism expansion. Numerous branches have been established and additional ones are contemplated at strategic distributing points. Executives of the ncompany look for a very satisfactory increase in business over that of the year just closed.

Sherman with Industrial Salvage

George W. Sherman, for many years connected with the B. F. Goodrich Company, resigned January, 1920, in order to devote his time to the development of the Akron Industrial Salvage Company and other personal interests.

Mr. Sherman graduated from the Massachusetts Institute of Technology in 1894 and became connected with Colgate and Company, soap manufacturers, as assistant mechanical engineer. He was later identified with the Boston Woven Hose and Rubber Company as master mechanic, and subsequently entered business for himself in Boston as a consulting mechanical engineer. Late in 1901 he came to Akron and was sent to Liverpool, England, by the stockholders of the Diamond Rubber Company who at that time owned the Northwestern Rubber Company, of Liverpool. This company was engaged largely in the reclaiming of rubber in England, and Mr. Sherman served there as superintendent. Coming back to Akron several years later, he became the first mechanical engineer of the Alkali Rubber Company, now the Philadelphia Rubber Works Company. In 1908, he returned to the Diamond Rubber Company and assumed charge of all by-product, scrap and salvage work, continuing as the head of these departments and in the same capacity for the B. F. Goodrich Company after the consolidation until January 1, 1920.

It was during the war that Mr. Sherman organized the Akron Industrial Salvage Company, having as its members one hundred and twenty-five Akron manufacturers and merchants. The value that these members gained from their waste products so increased the scope of the work that it now calls for practically all of his time. His plan of organization of the Akron Industrial Salvage Company was so thorough and effective that the Department of Commerce issued a special government bulletin dealing with the detailed development of the plan and its vast possibilities.



GEORGE W. SHERMAN

In addition to his other activities, Mr. Sherman is also in charge of the chemical department of the McAdoo-Akron Company, a new corporation recently organized to manufacture a rubberized cotton work glove.

Webster with D. and M.

The D. and M. Cord Tire Company has been particularly fortunate in securing Harry F. Webster as superintendent of production of Denman cord tires.

Mr. Webster is now on the ground at the new plant, seeing that every detail of its construction furthers the efficiency of building Denman cord tires.

A graduate of Miami University in 1912, Mr. Webster has since that time specialized in scientific factory manage ment and production. From 1913 to 1914, he was in charge of the efficiency department of the Goodyear Tire and Rubber Company. From 1914 to 1919, he had charge of factory efficiency work for the Firestone Tire and Rubber Company.

He was given a leave of absence to attend the First Officers Training Camp at Fort Sheridan, Ill., where he received a commission as captain of field artillery and served with the 331st Battery at Camp Grant and overseas until discharged in February, 1919.

Goodyear Promotions in New York

Recent announcement has been made by the Goodyear Tire and Rubber Company that it has extended the executive organizations of all districts of the United States in order that the efficiency of the firm's field forces be increased. In accordance with this policy the following promotions in the New York district have gone into effect:

A. W. Ellis is now manager of automobile tire sales for the entire New York district territory. He will be located at the district office in New York City, so in spite of his broader field of operation, he will still be in close contact with the New York branch trade with whom he has worked so successfully during past years as branch manager.

S. H. Cunningham is now manager of the New York branch. In his former position of assistant manager of this branch he was naturally in close contact with the New York trade, which insures that their needs and expectations will receive his close personal interest and attention.

W. G. Bedford has been made assistant manager of the New York branch. As he was formerly service manager at this branch, he has also had very close contact with the New York trade.

National Aniline Elects

At the annual meeting of the stockholders of National Aniline and Chemical Company, Inc., held February 16, 1920, the following were elected directors for the ensuing year: Orlando F. Weber, H. H. S. Handy, W. N. McIlravy, Dr. W. G. Beckers, Dr. L. C. Jones, C. S. Lutkins, Henry Wigglesworth, W J. Matheson, T. M. Rianhard, Dr. R. C. Taggesell and F. M. Peters.

At a special stockholders' meeting held on the same day, the number of directors of the company was reduced from sixteen to twelve.

The following officers of the company have been appointed by the Board of Directors: President, Chairman of the Board and Chairman of the Executive Committee: O. F. Weber, vice-presidents, Dr. W. G. Beckers, J. W. Newlean; acting treasurer, Wm. H. West; secretary, H. F. Atherton; assistant-treasurers, H. S. Trott, T. S. Baines; assistant-secretary, R. V. Mahon.

A quarterly dividend has been declared of 1¾ per cent for the period ending March 31, 1920, on preferred stock payable April 1, 1920, to preferred stockholders of record at the close of business on March 15, 1920.

Jackson with Firestone on Coast

The Firestone Tire and Rubber Company announces the appointment of L. R. Jackson as manager of the Pacific Coast district with headquarters at San Francisco.

This news will be received with interest in tire circles of San Francisco and other large distributing points in this territory. The new district manager has been with Firestone for approximately eight years, starting as office manager for the Atlanta branch in 1912. He was transferred to the Detroit branch one year later and worked out of that city as a salesman. After three years of valuable experience along this line Jackson was transferred to the Grand Rapids branch, where he held the position of service manager until 1918, when he was transferred to the Indianapolis branch and installed as manager.

Epstein Leaves Bureau of Standards

S. W. Epstein, well-known to readers of THE RUBBER AGE as the author of a number of articles which have appeared in its pages from time to time, has resigned from the Bureau of Standards, Washington, D. C., where he has been as chief of the rubber section. He is being succeeded by D. Collier, formerly with the Boston Belting Corporation.

Mr. Epstein graduated from the University of Pennsylvania in 1917 with the degree of B. S. in chemistry and joined the staff of the rubber division of the Bureau of Standards immediately upon graduation. In 1918 he took charge of the branch laboratory of the Bureau, located at the University of Akron. From June 1919 to the date of his resignation he was in charge of the rubber division. Mr. Epstein is the author of a number of papers and articles upon rubber. Among these are the following: "The Determination of Free Carbon in Rubber Goods;" "The Detection and Determination of Glue in Rubber Goods;" "The Extraction of Rubber Goods," and "The Determination of Cellulose in Rubber Goods."

Columbia Tire Elects

The annual meeting of the stockholders of the Columbia Tire and Rubber Company was held at the Mansfield offices of the company, in the Mohican building, February 7. A large representation of stockholders was present and reports submitted by the officers show the company experienced a prosperous year and has an excellent outlook for 1920.

The directorate for the new year is as follows: G. W. Henne, E. O. Townsend, William Isaly, F. M. Bushnell, L. C. Chase, W. B. Martin, city; W. F. Henne, Piqua; J. C. Henne, Columbus, and W. G. Henne, Columbiana. From the board the following men were chosen as officers: G. W. Henne, president; W. G. Henne, vice president and general manager; W. F. Henne, treasurer, and Baird Broomhall, secretary.

Wyoming Tire Organized

The Wyoming Tire and Rubber Company has been organized with Ivan Mahoney as president; Wilmer Dunbar, of Greensburg, Pa., as vice president and general manager, and Evan H. Jones as secretary-treasurer. Directors of the organization are Dr. Emery Lutes, A. M. Bernstein, Ivan Mahoney, Edward Gross, John A. Redington, Jr., Evan H. Jones, Wilmer Dunbar and R. R. Van Horn.

Seven acres of land at Georgetown, Pa., have been purchased from the Atlas Powder Company by the Wyoming Tire and Rubber Company. The buildings will be grouped and by spring the new company expects to be manufacturing 500 tires and 500 inner tubes a day.

Mefford with Goodyear at Toledo

E. L. Mefford, service manager of the Goodyear Tire and Rubber Company, has recently been appointed manager of the Toledo branch at 1320 Madison avenue, to succeed Mr. Hilbish who goes to the Cleveland office as head of the motor truck tire sales. G. R. Lichty steps into Mr. Mefford's position as service manager. W. T. Leach has charge of the local office.

In the twenty-two counties in northwestern Ohio and one in Michigan there are at present twenty-one Goodyear service stations with tire-applying presses for the adjustment of the solid rubber kind. There are thirty-five to forty for pneumatic truck tires.

New Goodrich District Manager

From a new salesman in 1914, unfamiliar with Goodrich policies, to the position of district manager of the B. F. Goodrich Rubber Company, San Francisco, at the dawn of 1920, is the remarkable achievement of W. T. Powell, which has recently been announced by W. O. Rutherford, vice-president in charge of sales.

For the past nine months Mr. Powell has been acting manager during Manager F. Richard Carroll's absence in the Orient on an important mission for the Goodrich interests.

Mr. Carroll will now be permanently located in Japan as special representative for the Goodrich company in the Far East and Powell's appointment as his successor in San Francisco is the logical result of his able management of the sale of Goodrich and Diamond products.

Although Mr. Powell's rise in the rubber world has been rapid, it is not surprising to those who were intimately acquainted with his unusual sales and executive ability.

Cotton Market Conditions

Following is a resume of conditions in the cotton market according to a bulletin received from A. Norden and Company, dated February 5:

Temporarily, at least, the adverse factors to which we referred last week seem to have won, and on the surface it really would appear useless to talk about higher prices for cotton or anything else, with the whole financial world in a demoralized condition, and with every indication that drastic measures must be adopted by some of the European nations to prevent a total collapse. The constant and enormous depreciation in the value of European currencies, or perhaps it might be better to say, the constant and enormous increase in the relative value of the American dollar, is certainly a factor that must be seriously considered.

Owing to these conditions, all kinds of rumors have been circulated as to cotton being resold here by Liverpool, to take advantage of the profit in the rate of exchange since the cotton was bought, and as to restrictions by the British government of further importations of cotton. The former is not likely to take place except on a very small scale, and the latter is entirely unworthy of consideration, as England is not going to give up, but on the contrary, is going to work harder than ever for recovery, and one of her principal weapons is her pre-eminent position in manufacturing cotton goods for the world.

After all, as we have said before, we do not think the rate of exchange is so vital in the cotton manufacturing trade, as the loss when importing the raw material is much more than recovered on the exportation of the manufactured article; what is nerve-racking is the constant fluctuating of rates, that prevents any safe calculation. Once Sterling shows signs of settling around a certain level, whether that level be $3.75 or $3.50 or $3.00, we believe the disturbance of world trade will be over, though, of course, the hardships of the peoples of Europe may continue great during many years.

We cannot help feeling, therefore, that the short selling of the last few days, while temporarily successful, will prove unwarranted in the long run, and we would rather see our friends take advantage of weak moments to make purchases, though of course in such markets it would be imprudent to have any very decided opinion.

Firestone Film Shown

Under the auspices of the State and City of New York, the Firestone film, "Careless America," was shown recently to more than 5,000 school children at the Capitol Theater, New York, the largest playhouse in the world, as the opening wedge in a nation-wide Safety First campaign.

Secretary of War Baker, Secretary of State Francis M. Hugo, of New York, Miss Julia Arthur, the well-known actress, and other distinguished personages, addressed the children prior to the exhibition of the film. A committee of one hundred members, John D. Rockefeller, Jr., chairman, representing the leaders of New York social and financial life, sponsored the picture and lent their endorsement by their presence and letter of commendation.

The film was made by Harry Levy, of the Universal Film Company, for H. S. Firestone, Akron, Ohio, who is seeking to impress upon youthful America the dangers of careless pedestrianism, and upon automobilists the evils of reckless driving. It depicted distressing accidents and gave the A B C's (Always Be Careful) of Safety First.

Want Two Years Passports

American business men abroad should have passports good for two years instead of six months, says a writer in the January number of *Anglo-American Trade*, the monthly publication of the American Chamber of Commerce in London.

British passports even during the war were good for two years, with the privilege of extension for subsequent periods of two years, whereas the two extensions permissible on American passports make its total life only eighteen months. Since it takes about three months for an American abroad to get a new passport from Washington, it is claimed that the American business traveller in foreign fields is at a disadvantage with his British competitors.

Mississippi Increases Stock

The Mississippi Valley Company voted, unanimously at its annual meeting of shareholders to increase its capital stock from $250,000 to $2,000,000. This forecasts increasing the output from the present capacity of $1,000,000 worth of tires, etc., a year, to as many more millions, and as splendid new machinery, equipment, and increased building quarters will make possible, as the days go by.

The stockholders unanimously elected the directors who have done so much to make the great industry a success in a short time. The roster follows: J. O. Schultze, president; Preston E. Roberts, Fort Madison, vice-president, and George Sueppel. Louis Baschnagel is secretary. The others will be elected at a later date.

Goodyear Department Changes

Changes in the development department organization of the Goodyear Tire and Rubber Company have been announced to become effective Feb. 15: James E. Hale, manager of the rim and wheel department; William S. Wolfe, from technical service division to head of tire design division; Walter B. Keith, to succeed William S. Wolfe as head of technical service division; Burgess Darrow to become head of the technical service division of the California factory.

News From The Trade At Large

Miller Rubber to Increase Stock—Amazon Rubber Reorganized—Mansfield Elects Officers—Goodyear Minimum Day Wage—Bergougnan Heads Meet in France—Council Rubber to Build

Miller to Increase Stock

(Special Akron Correspondence)

Stockholders of the Miller Rubber Company early this month voted to triple the capital stock, the authorized increase being from $20,000,000 to $60,000,000. Of the new capitalization, $20,000,000 is in common stock and $40,000,000 in eight per cent preferred stock. Directors of the company were authorized to sell $10,000,000 of the new preferred and to retire $3,155,000 of first preferred and $2,000,000 of second preferred stocks outstanding.

While rumors of large expansions and mergers with smaller tire companies are being circulated, Miller officials maintain that the increase in capitalization was made necessary by rapid growth in sales. The new capitalization, it is pointed out, will enable the company to expand materially and handle the large increase in orders.

The stockholders at their annual meeting also voted to increase the membership of the board of directors from five to seven. The old directors, Jacob Pfeiffer, C. T. Grant, J. M. Doran, F. B. Theiss and William F. Pfeiffer, were re-elected. R. T. Griffiths, factory superintendent, and F. C. Millhoff, general sales manager, were named as new directors. All the officers were re-elected, namely: Jacob Pfeiffer, president; C. T. Grant, vice-president; William F. Pfeiffer, secretary, treasurer and general manager, and C. R. Wetsel, assistant secretary.

Gross sales for the year 1919 were $26,495,482, it was reported to stockholders. Profits before providing for federal taxes were $2,193,547.50. Sales for January were $3,053,883, as compared with $1,447,874 for the same month last year. It is estimated that sales for the present year should exceed $40,000,00, as the company is oversold on all its lines.

Amazon Rubber Reorganized

(Special Akron Correspondence)

A group of Akron capitalists have taken over the Amazon Rubber Company of East Akron, it has been announced. A new factory will be erected and the operations of the company extended.

Dr. E. E. Quirk has been elected president of the reorganized company, Frank B. Burch, vice-president; Walter Herberich, treasurer, and George Hupp, secretary. Dr. Quirk, Frank B. Burch, George Hupp, Gus Burkhardt, Albert Kroehle, Louis Schott, W. A. Boesche, M. D. Kuhlke and J. A. Berger are members of the new board of directors. Mr. Schott is retiring president of the company. Messrs. Hupp and Kroehle also have been connected with the Amazon organization.

Capitalization has been increased from $400,000 to $1,500,000. Only $500,000 of the new stock will be sold at this time, however.

A new site has been purchased on the A. C. and Y. railway beyond the city limits and with frontage on the Little Cuyahoga river. A new factory will be built there this year. In the meantime production at the present plant will be increased from 250 to 500 tires a day.

Mansfield Elects Officers

With records showing the year closing to be the most successful in the history of the organization, stockholders of the Mansfield Tire and Rubber Company held an interesting annual meeting February 7 at the general offices of the plant at Mansfield, Ohio. Sales records for 1920 show that under present conditions, this year will even surpass in total business the good record made during the past twelve months' period. Building plans, whereby the present plant will be still further enlarged, were discussed and an early agreement as to the exact details will soon be made.

P. H. Ober, C. L. Willsey and A. J. Reynolds were named as members of the board of directors to succeed William Isaly, W. F. Henne and G. W. Henne. At the close of the stockholders' meeting the directorate met to choose officers. Those to be selected for the year are: C. R. Grant, president; G. W. Stephens, first vice president and general manager; P. H. Ober, second vice president; Charles Hoffman, treasurer and assistant general manager; J. E. LaDow, secretary, and C. L. Willsey, assistant treasurer and auditor.

A. J. Reynolds, who assumed the duties of sales manager last year when Mr. Stephens became ill, will continue in the same capacity and in addition supervise the sales of the New Jersey Car Spring and Rubber Company.

Goodyear Minimum Day Wage

The Goodyear Tire and Rubber Company has announced the establishment of a minimum day wage scale of $6 for all male factory employes who have been employed continuously for six months or more, and a minimum day wage of $4 for female factory employes. In addition pay increases of approximately ten per cent on hourly rates and from five to twelve per cent on piecework rates will become effective March 16.

All employes who have been with the company six months or more now working on a piecework basis will be affected by the minimum wage. Those working on a day work basis will get the benefit of the new hourly wage increases.

Announcement of increased wages and the establishment of minimum pay for men and women was made by P. W. Litchfield, factory manager, at a meeting of the Industrial Assembly.

In making the announcement, Mr. Litchfield stated that the possibility of introducing the minimum wage had been carefully considered for some time and the present form adopted. Giving the high cost of living as the principal reason for introduction of the minimum wage and increases in hourly and piecework rates, the factory manager declared, "There is no indication of a decrease in the cost of living. A few months ago we hoped there would be a halt in the constantly increasing cost of necessities, but there has been none and there are no indications at present that there will be."

To benefit by these wage increases workers must have been employed continuously for six months, must be American citizens, able to speak English and more than eighteen years old.

Bergougnan Heads Meet

H. H. Coleman, president of the Bergougnan Rubber Corporation, Trenton, N. J., sailed for Europe aboard "La Lorraine" on January 20 to attend the annual Bergougnan convention at Clermont-Ferrand, France. He expects to remain aboard for several weeks.

Each spring the heads of the several concerns controlled or owned by the Societe Generale des Etablissements Bergougnan come together at the headquarters of the parent company in Clermont-Ferrand to talk over results obtained during the previous year and to discuss plans for the ensuing twelve months.

Founded more than thirty years ago by R. C. Bergougnan, the Etablissements Bergougnan have grown into a hugh world-wide organization including rubber plantations in French Indo-China, rubber manufacturing plants in France, Russia, Italy and the United States, tire and other rubber goods sales companies in all parts of the civilized world.

The annual Bergougnan conventions include Bergougnan heads from all European countries, also India, China, the Straits Settlements, French Indo-China, Australia, New Zealand, Tasmania, Japan, South Africa, Northern and Central Africa, South American countries, the United States, Canada and Mexico.

Working in close cooperation the several Bergougnan companies get the benefit of each others' experience and knowledge, with the result that their efficiency and the quality of their products are greatly benefited.

Council Rubber to Build

The Council Rubber and Tire Company was recently incorporated at Des Moines, Iowa, with an authorized capital stock of $1,500,000 for the announced purpose of building and operating a factory at Council Bluffs. W. R. Blowers is the president and general manager. Mr. Blowers, it is stated, comes from the east where he was engaged for thirty years in the rubber business and it is stated has a very wide and practical working knowledge of all the processes and methods for making rubber goods.

F. J. Alexander, it is stated, will be sales manager of products of the new company. He has been with the Boston Belting Company and other big concerns and is especially well acquainted with the tire business.

According to the prospectus the new firm will begin by erecting a unit of what it expects will be a great plant in the near future. A total of 100,000 square feet of floor space will be required at the start and this will be expanded as necessary, according to the company's statement. Cord tires will be one of the principal products, though a reclaiming plant will be operated and many rubber products produced if the plans of the company mature.

Zenith Tire to Build

Reports are in circulation to the effect that the ranks of industry in Cleveland, Ohio, will be increased by the addition of the Zenith Tire and Rubber Company. It is stated that 236 acres have been purchased for the erection of a plant and that $1,000,000 will be expended for that purpose. Other plants will be operated through the control of the stock. B. C. Swinehart, for many years identified with the tire industry will be a director in the new organization and will also act as general manager.

Wellman-Seaver-Morgan Report

At the annual meeting of the stockholders of the Wellman-Seaver-Morgan Company, held at the company's office on February 17, the following report of the year's work was given by the President, E. S. Church.

To the Stockholders of the Wellman-Seaver-Morgan Company:

The year 1919, in so far as the metal industries were concerned, may be best described as one of great expectations but deferred realization. Starting with the cessation of hostilities, manufacturers whose hopes had been raised to a high pitch by the anticipated demands for the rehabilitation of the devastated areas, early found themselves disillusioned; all emergency government work was rapidly discontinued, readjustments of business to peace conditions interfered with efficient operation of plants, and strikes, local and national, served only to increase the difficulties under which executives and employes were laboring to carry on work to a successful issue.

Our company may look back with great satisfaction on the results obtained from the contracts undertaken with the national government. Within a very short time we shall have completed over $3,350,000.00 of equipment for the torpedo boats. The entire work has been carried on without any friction between ourselves and the Navy Department, and all adjustments made with them have been very fair. There has been no criticism of our workmanship and deliveries, and we have been highly complimented on our methods of handling the work, by the presidents of the shipbuilding companies to whom the equipment was shipped.

Orders which we have lately received for large engineering installations give promise of renewed activities in these lines, and we may look forward to having both shops running to full capacity during the coming year. A comparison of the unfilled orders on hand on January 31st of this year, amounting to $4,875,000.00 and those on hand at the same time last year, amounting to $3,915,000.00 is encouraging evidence of what may be expected.

The increase in the business of the company, shown in condensed form, will be of interest to the stockholders:

	Gross Business.	Net Profit After Federal Taxes.
For 12 years preceding 1917—average	$2,120,083.32	$73,888.62
1917	4,687,928.00	466,604.31
1918	7,559,488.47	343,082.63
1919	7,478,118.91	534,942.26

During the year 1919 the company has taken what we consider ample depreciation on buildings and equipment, and has also absorbed a considerable development expense of a constructive nature to keep our several lines of business up to the highest standards.

At no time in the history of the company have its physical properties or its finances been in as good condition as they are today. At the Akron plant many new machines, cranes and labor-saving devices have been installed, buildings have been repaired, and other much needed improvements carried out, enabling us to produce rubber machinery on a very large scale. At the Cleveland plant a new acid furnace for making steel castings is nearing completion, which, together with the additional cranes and other improved machinery already in place, will put us in a position to compete to advantage with other companies manufacturing our lines of equipment.

Financially, we have reduced our borrowed capital from $1,200,000 to $425,000; we have regularly paid our quarterly dividends, besides the deferred dividends on the preferred stock for the years 1917 and 1918. The original issue of preferred stock has been redeemed and cancelled, and there is but one class of preferred stock outstanding. Our working capital is ample for anticipated requirements.

While your company starts the new year well prepared to hold its own, prudence dictates the need of discounting the probable continuance of a large volume of business at the present high level of prices, and the need of conserving in every possible way our resources. The continued demand of labor for increased wages, the great drop in the value of foreign monies, the tightening down of the reserve banks on extension of credits, indicate a tightening of business, and point to the necessity of carrying on operations with the greatest care, and exercising rigid economy in every direction. The present prospects are excellent for a profitable year, and should they continue, we may look forward to continued prosperity.

Cotton Supply Decreases

The decline in the world's supply of cotton will jeopardize England's great cotton industry unless the quantity can be increased, says the American Chamber of Commerce in London, directing attention to the report recently made to the Board of Trade by a committee representing the British Empire Cotton Growing Association. In the cotton industrial districts of Lancashire and Yorkshire, the American Chamber understands, 600,000 people are directly dependent for their living on cotton, while indirectly 5,000,000 are dependent on it.

The main dependence of Great Britain's cotton industry is admittedly on supplies of American cotton; and, as the Chamber points out, within the past five years, for various economic and climatic reasons, the American cotton acreage has considerably decreased while her consumption has increased. British experts have estimated that if the yearly American crop should drop below the average, say, of 15,000,000 bales, of 500 lbs. each, of which Britain normally absorbs 415,000 bales, the Lancashire trade would have to resort to short-time working. Given a continuance of the same shortage conditions, all manufacturing machinery would ultimately cease. In view of this opinion, the estimated drop this year in American cotton to 11,000,000 bales, is giving rise to much serious thought in Britain's trade circles.

Taking pre-war figures as a basis, the American Chamber places the world's total output of cotton at, approximately 25,500,000 bales, of 500 lbs. each. Of the finest Sea Island cotton grown (and also the smallest crops), the British Empire takes 4,000 bales out of a total of 12,000; of the second grade, and the best Egyptian cotton, totalling 622,000 bales, the Empire takes 552,000; of the remaining 1,000,000 bales of Egyptian, African, and Peruvian cotton, Great Britain's share is 750,000 bales.

New Firm in Sioux City

T. P. Forbes has established a branch of the Tri-State Tire corporation of Sioux City, at Sioux Falls, S. D. The salesroom is located at 110 South Phillips avenue and both jobbing and distribution of the Curtiss cord and fabric tires will be taken care of. Branches have also been established at Huron and Mitchell.

Akron Stock Prices

(Special Akron Correspondence.)

Announcement by directors of the B. F. Goodrich Rubber Company of a plan to provide for broader financing to increase the working capital made necessary by rapid growth has served to stabilize to an extent the quotations on the preferred issue of that concern. Goodrich preferred has remained between 94 and 95 on the local stock market for the past few weeks.

The Goodrich directors have determined upon the issuance of $30,000,000 of five-year convertible gold notes, convertible after two years into common stock at $80 per share. In reaching this conclusion the directors considered the sales for 1919 of $142,000,000 and the estimated sales for the present year at over $200,000,000.

The proposed new financing will constitute a stable investment, and will possess additional advantages of enabling the holders of the new securities to participate in the constantly increasing prosperity of the company through the acquisition of its common stock, the market price of which should reflect the assured increase in earnings due to the expansion of the business.

As a part of the new financing plan, which directors will present to Goodrich stockholders at a special meeting called for March 10, a proposal will be made to change the common stock to a non-par value basis.

Notwithstanding the announcement of the refinancing plan, Goodrich common has been unable to withstand the general depression on the New York stock exchange and has slipped below the 70 mark for the first time in months.

Following are quotations on Akron rubber stock market for February 16:

	Bid.	Asked.
Amer. R.-T., com	85	..
Amazon Rubber	..	101
Firestone com.	..	180
do 6 per cent pfd.	..	97
*Firestone 7 per cent pfd.	97	99
General Com.	550	..
General Pfd.	100	..
B. F. Goodrich com	67½	68½
do pfd.	94	95
*Goodyear com.	360	370
do 1st Pfd.	98	98½
India Rubber	185	..
Kelly-Springfield	117	119
Mason com.	28	..
do pfd.	..	80
Marathon Com.	..	51
Miller, com.	..	180
do 1st pfd.	113	114
Mohawk, com.	..	345
Portage, com.	..	109
Portage Pfd.	..	90
Republic Com.	3	4
Republic 1st Pfd.	..	90
Republic 2d Pfd.	..	80
Rubber Products	..	134
Star Rub. Com.	350	400
Star Rub. Pfd.	99	..
Swinehart Com.	..	92½
Swinehart Pfd.	..	90
Phoenix Rubber, com.	..	23
do pfd.	..	90
Standard Tire	150	200

* Ex. Dividend.

Goodyear Aero Catalog

(Special Akron Correspondence.)

The Goodyear Tire and Rubber Company has issued the first aeronautical catalog for lighter-than-air craft. In detailing various types and pointing out possible commercial uses, the company officials say they are endeavoring, through the catalog, to determine just how many private persons will purchase this kind of aerial carriers.

MARKETS

Manufactured Rubber Goods

NEW YORK, February 21, 1920.

Reports from Akron and other rubber cities state that manufacturers of rubber goods are meeting with difficulty in obtaining sufficient labor to operate their plants. The rapid expansion of tire manufacturing and other rubber companies this year will call for more and more labor, and manufacturers are anticipating ever-increasing trouble in getting enough workers.

At the present writing there are no indications that the peak of prices on rubber goods has been reached. Markets for raw materials are far from stable, and show indications of registering further advances. Manufacturers who have been working on their reserve stocks of materials, bought at lower prices, will have to boost their selling prices when they begin making replacement purchases of materials.

EXPORTS

With the foreign exchange market still in a bad slump, the export trade is considerably restricted. Rubber goods are feeling this curtailment of buying to some extent, but there is still a certain amount of inquiry from foreign buyers who seek American rubber products, despite their high prices, because of their recognized superiority. Foreign buyers are reported to be ready to place immense orders for rubber heels and fibre soles, and American surgical rubber goods are wanted in all parts of the world. In addition to this export buying of mechanical goods is reported.

AUTOMOBILE TIRES

The tire selling trade is "on edge" in anticipation of the long-heralded advance in prices, and it is believed that tire prices will be increased by many of the manufacturers before the spring buying gets under way. Tire manufacturers continue to plan for the extension of business during 1920, some of the larger companies planning to increase capacity 100 per cent.

DRUGGISTS' SUNDRIES

A steady routine business in druggists' sundries is reported, and continuance of influenza weather is keeping trade at the retail stores on an active basis. This activity is being reflected in the buying in wholesale circles. While domestic business in general is reported to be seasonably good, export buying has fallen off somewhat during the past few weeks.

MECHANICAL GOODS

With the railroads slated for an early return to private ownership, manufacturers of mechanicals are anticipating a good demand for hose and couplings, as reports from time to time have shown that the stocks on hand by the railroads have undergone depreciation. Some demand for hose is reported, and the market is stronger as the result of recent advances in the prices of fabrics. Buying of belting is fair for this time of the year.

MISCELLANEOUS PRODUCTS

The blizzard which tied up New York for more than a week started a run on rubbers which practically cleaned out the stocks of the retail shoe stores all over the city. A prospective buyer had to visit from five to ten stores to get rubbers, and then it was a case of taking what he could get,—and paying what the dealer asked, instead of regular prices. A good demand for rubbers is consequently reaching manufacturers, many of whom were unable to get immediate deliveries through, owing to the storm.

A better inquiry for rubber heels is reported with the approach of spring. Manufacturers of the more popular brands are having trouble in keeping up with their domestic orders, and it is now reported that foreign buyers are in the Akron market ready to contract for the output of a large company for the coming five years. Fibre soles are selling in fair volume to the domestic trade.

Manufacturers are now getting out their spring lines of rubber bathing caps and rubber-soled footwear. A record-breaking demand for rubber footwear is expected this season, and manufacturers of the more popular brands have made preparations to handle an increased volume of business.

Cottons, Yarns and Fabrics

NEW YORK, February 21, 1920.

"Gossip is bearish, but facts are bullish." With these words, a leading authority aptly summarizes conditions in the cotton market at the present time. Despite talk of unfavorable conditions in the cotton market, a comparison of statistics covering the past fortnight will show a steady advance. February option at the close on February 9 sold at 36.10 cents per pound, at the close of yesterday it was held at 37.15, an advance of 1.05 cents; March option showed an advance of 1.66 cents, April of 1.75, and so on throughout the entire list of futures.

The market early in the month was still in the process of recovery from the scare occasioned by the exaggeration of the English situation, and this accounts partly for the low prices ruling at that time. Manchester spinners are still big buyers in the American market, working full time on tremendous orders from the Far East, mainly China and India. These countries find their currency has much more value than normally, accordingly English spinners are reaping a harvest variously estimated at from 100 to 300 per cent profit.

Reports from the South indicate that holders in that section of the country are unchanged in their views on the market, and are not inclined to sell heavily at present prices. Reports from the South hold the market on good stock at 40 cents, which is considerably over prices now ruling on the local exchange. There is an abnormal demand for the staple reaching the Southern growers, who are inclined to parcel out their remaining stocks but sparingly in anticipation of a higher market.

A prominent broker in a current market review says: "We think the enormous demand for manufactured cotton goods along with the ability and determination of the owners of the cotton left unsold, to sell only sparingly and at a constantly advancing price, will prevent any sustained decline in the cotton market, and in our opinion justifies very much higher prices."

EGYPTIAN COTTON

Another cargo of Egyptian cotton, consisting of 12,000 bales, valued at $9,000,000 has arrived at Boston during the past fortnight. There is an active demand for the cotton in tire fabric spinning circles, and the market is quoted at $1.38 for fully good Sakellaridis and $1.33 for good fair to fully good, c. i. f. landed at Boston. Under date of January 16, the following report has been received from Alexandria: "Tremendous bullish excitement has prevailed in our futures market, resulting in a fresh rise on the week of $15.50 for March. Realization of speculators' profits produced at one moment a set back of $10 but the drop was easily recovered today and the market closed very steady. All the interior merchants have accumulated huge profits during the season, and the general opinion prevailing is that they will hold what cotton remains in their hands for still higher prices. It is to be feared that spinners will sooner or later have to meet the exorbitant demands of the sellers; we still have nine months to run before the new crop will be available, and, at a rough guess, we estimate the remainder of our crop unsold to spinners at very little over one million cantars."

AMERICAN-EGYPTIAN COTTON

A steady demand for American Egyptian is reported, and the market is showing a strong tone, with prices firmly held on the basis of $1.05 per pound for No. 2 to 3 grade of Pima. This represents an advance of 10 cents per pound over the prices prevailing a short time ago, and the market is showing a strong undertone, growers reporting a strong and active call for their product from tire fabric spinners.

SEA-ISLAND COTTON

A strong call for long staple Sea Island cotton is reported in Southern markets, and the market is quoted at 90 cents per pound for fully fine "Islands," while extra choice Georgia Sea Island cotton is held at 87 to 88 cents per pound for average choice. Sea Island cotton of No. 2 grade, or extra choice, is quoted at 87 cents per pound for average staple.

TIRE FABRICS

There is a strong tone to the market for

tire fabrics, and prices are strong, although nominal in most instances, selling prices depending upon seller and conditions surrounding each sale. Tire makers who have been working on their reserve supplies of fabric are coming into the market for more stocks, and it is believed that prices on finished tires will go higher when the manufacturers begin to use fabrics bought in the present market. The market on 17¾ ounce combed Sea Island fabric is nominally held at $2.25 @ $2.35 per yard, combed Egyptian at $2.00 @ $2.20, carded Egyptian at $1.80 @ $1.90, carded peelers at $1.25 @ $1.35, and combed peelers at $2.25 @ $2.35.

HOSE AND BELTING FABRICS

The market for hose and belting ducks is showing a firmer tone, and prices are firmer, prices being quoted at 74½ to 78 cents per pound. Enameling duck is held at 88 cents per pound, with shoe ducks quoted at 92 @ 95 cents by leading sellers. Single filling duck is held at 34 @ 36 cents per yard, with double filling quoted at 37½ @ 40 cents per yard.

DRILLS, SHEETINGS, AND OSNABURGS

A quiet market for drills and sheetings has been in evidence during the past fortnight, and the market has been in a sluggish condition, with price changes being negligible. Second hands have cut their prices to some extent, but the mills are still holding at firm levels. Reports from New England mill cities report that the mills are booking a fair volume of business, and are looking for a more active market within a short period.

BURLAPS

There is an easier tone ruling in the spot market for burlaps. Spot 8 ounce 40s are offered at about 11 @ 11¼ cents per yard, with importers generally holding at the outside figure. The market on 10½ ounce stock is held at about 17¼ to 17½ cents per yard for both spot and nearby delivery. The market on 10s holds at about 16.10 to 16.50 cents per yard, depending upon seller. Light shipments from Calcutta during February are reported, only 4 ships being scheduled to sail, against 5 last month.

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.		2.25@2.35
17⅞-ounce Egyptian, combed		2.00@2.20
17⅞-ounce Egyptian, carded		1.80@1.90
17⅞-ounce Peelers, carded		1.25@1.35
17¼-ounce Peelers, combed		2.25@2.35

DUCKS

Belting (pound basis) lb.	.74½@	.78
Hose (pound basis)	.74½@	.78
Enameling	.88 @	..
Shoe Ducks	.92 @	.94
Single filing yd.	.34 @	.36
Double filing	.37½@	.40

DRILLS

37-inch 2.35-yard yd.	.34 @	.34½
37-inch 2.75-yard	.31 @	....
37-inch 3.00-yard	.30 @	....
37-inch 3.25-yard	.27½@	.28
37-inch 3.50-yard	.25½@	.26
37-inch 3.95-yard	.24 @	....
37-inch 2.00-yard Southern	Nominal	
37-inch 2.00-yard Northern	Nominal	
40-inch 2.40-yard Southern	Nominal	
40-inch 2.40-yard Northern	Nominal	
52-inch 1.90-yard Southern	Nominal	
52-inch 1.90-yard Northern	Nominal	

SHEETINGS

40-inch 2.35-yard yd.	.... @	.....
40-inch 2.50-yard	.34 @	.36
40-inch 2.85-yard	.31½@	.33
40-inch 3.00-yard	.... @	....
40-inch 3.25-yard	.... @	....
40-inch 3.75-yard	.26 @	.27
40-inch 3.60-yard	.28 @	.29
40-inch 4.25-yard	.24 @	.24½

Note.—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS

(Carload lots)

		Cents Per Yard	
7 -ounce 40-inch	.... @	....
7½-ounce 40-inch	.... @	....
7½-ounce 45-inch	.... @	....
8 -ounce 36-inch	.... @	....
8 -ounce 40-inch	11.00@	11.25
8½-ounce 40-inch	12.25@	....
10 -ounce 36-inch	.... @	....
10 -ounce 40-inch	16.10@	16.50
10 -ounce 45-inch	Nominal	
10½-ounce 40-inch	17.25@	17.50

Chemicals and Compounding Materials

NEW YORK, February 21, 1920.

A strong market for all varieties of chemicals and compounding materials exists and growing shortages are reported in many lines. Reports from manufacturers would indicate that the labor shortage is the paramount factor in the situation now, and production is being hampered to some extent by the difficulty experienced in getting help. Producers, however are doing all in their power to speed up.

The market for leads shows more strength, and pigments are reflecting this firmness. Arrivals of goods from abroad are increasing, but the demand is such that these arrivals do not cut much figure in market prices. Much of the demand for the compounding materials is coming from the paint trade, an abnormal demand for this product being noted at the present time. The rubber trade is also an active buyer, and the requirements of the rubber industry are getting larger as manufacturers expand production.

EXCHANGE CURTAILS EXPORTS

The weak position of the foreign exchange market is curtailing export buying of chemicals and compounding material to some extent, but there is still considerable activity noted in this connection. Imports are increasing, although no undue publicity to the imports is being given by handlers as yet. Labor troubles abroad are interfering with the shipment of raw materials to the American market. Much difficulty is being experienced in getting consignments from Italy, France and Spain where railroad conditions are said to be chaotic.

BENZOL SCARCE

Spot supplies of benzol are not large, and producers are unable to offer any supplies for immediate delivery. Sales have been reported at a range of from 30 to 36 cents during the past few weeks, but this price basis is higher than under ordinary conditions. Producers are trying to speed up their output, but it is believed that any heavy demand for this product would send prices higher.

SMALL SUPPLY OF LITHARGE

Producers of litharge are unable to take care of all the business offered them at the present time and are letting some of their export orders go unfilled for the time being and are concentrating their output in the filling of domestic demand. The market is quoted on the basis of 11¼ @ 11¾ cents per pound for American powdered in casks.

LITHOPONE SOLD UP

Producers are not booking any volume business on spot lithopone, and are allotting stocks only in lots of one, two, or three barrels for immediate delivery. No offerings of large lots of lithopone for nearby delivery are reported, producers being sold up ahead for some time to come. The market is reported held on the basis of 7½ @ 7¾ cents per pound in barrels and 7¼ cents per pound in bags, but a slight advance over this figure is reported as the asking price on spot stock.

WHITING STEADY

A steady tone features the market for whiting, but consumers are unable to obtain supplies in quantities sufficient to take care of their needs. Curtailment of importation of English chalk is given as the main cause of the shortage. The market on American paris white is held at $1.75, with commercial at $1.40 and English cliffstone at $2.

ORANGE MINERAL QUIET

A quiet tone to the market for orange mineral is noted in the local market, and prices are maintained on the basis of 14¾ @ 15¾ cents per pound. Producers are making efforts to speed up their production to take care of the demand, which is in excess of supplies at the present time.

BOOKING BARYTES BUSINESS

Producers of barytes are again quoting on barytes for near delivery, holding the market on the basis of $23 to $25 per ton, f. o. b. mills. Production is increasing somewhat, and producers expect to resume quoting future prices within a short time. Reports from the West indicate that the car shortage, which has been hampering deliveries of barytes for some time past, is less serious.

GLUE TRADE ROUTINE

Trading in glues continues to be quiet along routine lines, and the situation has shown no appreciable change during the fortnight under review. The market holds steady on the basis of quoted prices, and manufacturers are now able to take care of the business offered them.

COLORS BULLISH

Dealers and producers are not booking contract business on dry colors, due to the uncertainty as to whether or not they will be able to make conditions, should the present shortage of supplies grow more acute. Spot business is being accepted, and orders are being booked for shipment when available. The shortage of imported colors is growing more acute with the increase of labor troubles abroad.

Demand for blacks exceeds supplies, dealers say and the market is consequently showing a firmer tone. Blues are showing more strength, and the market is in an unsettled condition; the trade anticipating further advances in prices. Browns are showing an advancing tendency as the result of higher prices on imported raw materials. Producers of greens are booked ahead for a considerable period and are not keen on booking further business. Yellows are firmly maintained, while the market on colors in oils is very firm.

ZINC OXIDE FIRM

The market for zinc oxide is firmly held at recently-advanced prices. Producers are booking business with domestic consumers on the following basis: French process, red seal 9⅝ and 9¾ cents per pound; green seal, 10⅝ and 10⅞ cents per pound; white seal 11⅝ and 11⅞ cents per pound; leaded grades, commercial lead free 9⅛ @ 9⅝ cents per pound; five per cent lead sulphate 8⅝ and 9⅛ cents per pound; ten per cent lead sulphate 8⅝ @ 8⅞ cents per pound; twenty

per cent lead sulphate 8⅝ @ 8⅝ cents per pound; and thirty-five per cent lead sulphate 8¼ and 8⅜ cents per pound.

Current Prices for Chemicals, Fillers, Colors, etc.

Acetone, carlots	.lb.	.13½ @	.14
smaller lots	.lb.	.15 @	.16
Accelerator, in drums	.lb.	.85 @	1.00
Acids, Acetic, 56%	.cwt.	6.00 @	6.50
Carbolic, C. P.	.lb.	.12 @	.20
Muriatic, 20 deg.	.cwt.	1.75 @	2.00
Muriatic, 22 deg.	.cwt.	2.50 @	2.75
Nitric, 42 deg.	.cwt.	7.00 @	7.50
Nitric, 40 deg.	.cwt.	6.75 @	7.25
Sulphuric, 60 deg.	.ton	16.00 @	17.00
Tartaric, crystals	.lb.	.69½ @	—
Aluminum Flake	.ton	29.00 @	31.00
Aniline oil, bulk basis, Contract		— @	—
Imported		Nominal	
Domestic		.34 @	.36
Antimony, metal spot	.lb.	.11⅝ @	.11⅞
Oxide	.lb.	.13 @	.14
Sulphuret, red	.lb.	.25 @	.30
Sulphuret, golden	.lb.	.30 @	.35
Sulphuret, crimson	.lb.	.45 @	.50
Needle, powdered	.lb.	.13 @	.14
Asbestos	.ton	35.00 @	45.00
Asphaltum, Egyptian	.lb.	.30 @	—
Domestic	.ton	.30 @	.40
Barium sulphate, technical		.04½ @	.05
Sulphide	.lb.	.07¼ @	.07½
Barytes, prime white imported	.ton	Nominal	
white, domestic	.ton	.34 @	.36
off color, domestic	.lb.	.21 @	.24
Southern, f.o.b. mills		23.00 @	25.00
Western, f.o.b. mills		23.00 @	25.00
Benzol, pure, bulk	.gal.	Nominal	
Beta-naphtol, sublimed	.lb.	.70 @	.72
resublimed	.lb.	1.05 @	1.10
Blacks, Drop	.lb.	.05½ @	.15
Ivory	.lb.	.16 @	.30
Carbon, gas, cases	.lb.	.12 @	.25
Lampblack R. M.	.lb.	.15 @	.45
Mineral blacks	.ton	35.00 @	45.00
Blues, Prussian		.85 @	.90
Soluble	.lb.	.85 @	.95
Ultramarine	.lb.	.15 @	.50
Browns, Umber, Turkey, burnt, powdered	.lb.	.05 @	.06½
American, burnt	.lb.	.02½ @	.04
Cadmium sulhide, yellow	.lb.	1.75 @	1.80
Carbon bisulphide, bulk	.lb.	.06 @	.07
Bisulphide	.lb.	.06 @	.07
tetrachloride, drums	.lb.	.11 @	.12
Caustic Soda, 76%	.cwt.	4.50 @	4.60
Chalk, precipitated, extra light	.lb.	.05⅝ @	.06⅝
heavy	.lb.	.05 @	.06
China clay, domestic	.ton	8.50 @	20.00
imported	.ton	18.00 @	23.50
Fossil flour	.lb	.03¾ @	.05
Gilsonite	.ton	50.00 @	60.00
Glue, extra white	.lb.	.35 @	.40
medium	.lb.	.30 @	.35
low grade		.20 @	.25
foot stock		.13 @	.18
brown foots		.12 @	.16
common bone		.11 @	.15
Glycerine, C. P. (drums)	.lb.	.25 @	.25½
cans		.27 @	.29
Graphite, flake (bbl.)	.lb.	.14 @	.25
powdered (bbl.)	.lb.	.05 @	.10
Green, chrome, R. M.	.lb.	.37 @	.50
Ground glass (fine)	.lb.	.03½ @	.04
Hexamethylene	.lb.	1.40 @	1.60
Infusorial earth, powd'd.	.lb.	.02 @	.035
bolted	.lb.	.035 @	—
Iron oxide, red, reduced grades	.lb.	.13 @	.15
red, pure, bright	.lb.	— @	—
Lead, red, dry (casks)	.lb.	.11¾ @	.12
sublimed	.lb.	— @	—
white, basic carb.	.lb.	.10 @	.10½
white, basic sulp.	.lb.	.09¼ @	.09¾
Lime flour	.lb.	.01¾ @	.02
Litharge (casks)	.lb.	.11¼ @	.11¾
English	.lb.	— @	—
Lithopone, domestic, bbls.	.lb.	.07½ @	.07¾
in bags		.07¼ @	—
Magnesia, carbonate	.lb.	.17 @	.21
calcined light	.lb.	.60 @	.65
Magnesite, calcined, pwd.	ton	50.00 @	65.00
Naphtha, motor gasoline, (steel bbls.)	.gal.	.26½ @	—
68 @ 70 degrees (steel bbls.)	.gal.	.33½ @	—
70 @ 72 degrees (steel bbls.)	.gal.	.34½ @	—
73 @ 76 degrees (steel bbls.)	.gal.	.35½ @	—
machine (steel bbls.)	gal.	.45½ @	—
Oil corn, crude factory	.cwt.	19.56 @	—
corn, ref. (bbls.)	.cwt.	23.00 @	—
linseed (bbls.)		1.80 @	—
in carloads, spot		1.77 @	—
tank cars		1.72 @	—
Oil palm, Lagos	.lb.	.15½ @	—
Niger		.15 @	—
pine, yellow	.gal.	1.20 @	1.25
rapeseed, refined	.gal.	1.60 @	—
rapeseed, blown	.gal.	1.65 @	—
rosin, first rectified	.gal.	.97 @	—
second run		.96 @	—
tar (commercial)	.gal.	.36 @	.38
Orange mineral, Amer.	.lb.	.14¾ @	.15¾
imported	.lb.	— @	—
Paraphenylenediamine	.lb.	2.50 @	3.00
Petrolatum, bbls., amber	.lb.	.09 @	—
pale yellow	.lb.	.07½ @	.08½
Pine tar kiln	.bbl.	14.50 @	—
Pitch	.bbl.	8.50 @	—
Plaster of paris	.bbl.	2.00 @	3.00
Red Tuscan	.lb.	.22 @	.30
red (American)	.lb.	.25 @	.30
Indian (English)	.lb.	.14 @	.16
Standard	.lb.	— @	—
Rosin (common to good) 280 lbs.	.bbl.	18.00 @	—
Rotten stone, powdered	.lb.	.02½ @	.04½
Rubber, substitute, black	.lb.	.13 @	.17
white	.lb.	.15 @	.24
brown	.lb.	.20 @	.25
Shellac, fine orange	.lb.	— @	—
T. N.	.lb.	1.55 @	1.60
Bleached ordinary	.lb.	1.45 @	1.50
Bleached bonedry	.lb.	1.75 @	1.80
Silex (silica)	.ton	22.00 @	40.00
Soapstone, powdered	.ton	12.00 @	17.50
Starch, corn, powd.	.cwt.	5.97 @	6.23
pearl		4.97 @	5.19
Jap, potato duty pd.	lb.	.09½ @	—
Sulphur, crude	.ton,	— @	—
100 pounds		— @	—
roll		3.20 @	—
commercial superfine		2.00 @	2.25
Talc, American	.ton	20.00 @	40.00
French	.ton	— @	—
Toluol, pure, in drums	.gal.	.30 @	.32
commercial		.30 @	.32
Tripolite earth	.lb.	.01½ @	—
Turpentine, pure gum spirit	.gal.	2.07 @	—
wood	.gal.	1.60 @	—
Venice, artificial	.gal.	.15 @	.16
true		4.50 @	—
Vermilion, English	.lb.	1.35 @	1.45
American		.25 @	.30
Wax, beeswax, crude yel.	.lb.	.44 @	.45
refined		.47 @	.48
Bayberry		.40 @	.41
ceresin, white	.lb.	.15 @	.16
yellow		.15 @	.16

Scrap Rubber

NEW YORK, February 21, 1920.

The weak position of the crude rubber market is reflected in the market for scrap and trading is generally inactive. Reclaimers have not yet come into the market for scrap rubber in any quantity, and other buyers are also showing but little interest in the spot situation. Dealers, however, are holding the market on a firm basis in anticipation of the beginning of spring buying within a short time.

	Cents per Pound.	
Boots and shoes	8.00 @	8.37½
Arctics, trimmed	6.00 @	6.25
Arctics, untrimmed	5.00 @	...
Tires—automobile	3.25 @	3.75
Bicycles, pneumatic	2.50 @	3.00
Mixed hose	1.00 @	1.75
Air brake	2.75 @	3.00
Inner tubes, No. 1	14.50 @	...
Inner tubes, No. 2	9.00 @	11.00
Red tubes	9.50 @	10.00

Crude Rubber

NEW YORK, February 21, 1920.

A nominal tone rules in spot rubber, and the market is showing but little activity at the present time. Buyers are not in the market for large quantities, although there are usually buyers to be found when weak holders are compelled to sacrifice some holdings, particularly holders of warehoused rubber who are unable to obtain further accommodation from their banks.

Speculative buyers are keeping out of the market at this time, in view of the unsettled conditions in the financial market. Quotations on near positions have eased off somewhat during the past fortnight, but there is no stable basis of quotations in the present nominal market.

The London market is also weaker, the last cable quoting 34 d. c. i. f. New York.

	Cents per Pound.	
Para—Up-river fine	.43½ @	.44
Up-river medium	.41½ @	..
Up-river coarse	.33 @	.34
Caucho ball	.33 @	.34
Islands fine	.42½ @	.43
Islands coarse	.20½ @	.21
Cameta	.21¾ @	.22
Madeira, fine	.49 @	..
Knapsack	.. @	..
Ceylon—Smoked sheets, ribbed	.46¾ @	.47
Smoked sheets, plain	.45 @	..
First latex pale crepe	.46¾ @	.47
Amber crepe	Nominal	
Clean brown crepe	.41 @	..
Rio Nunez string	.. @	..
Palembang	.14 @	..
African	.33 @	..
Prime Surinam sheets	.. @	..
Centrals—Corinto prime	.32 @	..
Esmeralda, prime	.31½ @	.32
*Balata sheets	1.00 @	..
Guayule, wet	.25 @	.27
Balata, block, Panama	.45 @	.46

* Nominal.

Norwood Resigns from Republic

(Special Akron Correspondence)

News of the resignation of Guy E. Norwood, as president of the Republic Rubber Corporation, of Youngstown and Canton, came as a surprise in rubber circles here. Mr. Norwood has been head of the Republic since June, 1917. He resigned as secretary of the B. F. Goodrich Co. to take charge of the Youngstown concern.

Recent developments in Republic affairs led some observers here to look for changes following announcement that the company had passed dividends on a preferred issue. It is announced in Youngstown that Mr. Norwood will remain as a director of the Republic. He plans to stay in Youngstown for about two months, it is said.

Mr. Norwood is succeeded by E. F. Jones, who was vice-president of the Morgan Spring Co. operating a plant at Worcester, Mass. He is well known to Youngstown capitalists who were financially interested in that company until its sale about six months ago. Since that time Mr. Jones has been with an Elyria, Ohio, steel company.

Republic stockholders voted February 20 on an issue of 850,000 shares of no par common stock at a special meeting in New York City. It is understood the new stock will be offered at $5 a share.

Vorhis with Mid-West Association

Announcement has been made by the Mid-West Rubber Manufacturers' Association of the appointment of H. S. Vorhis as general manager of the association with offices in the McCormick Building, 332 South Michigan avenue, Chicago. Mr. Vorhis is well known in the rubber industry through his former connection with the Rubber Association of America, Inc., and the Mid-West Rubber Manufacturers' Association is convinced of the fact that his cooperation will mean much not only to the organization but to the rubber trade in general.

Avalon Elects Officers

(Special Akron Correspondence)

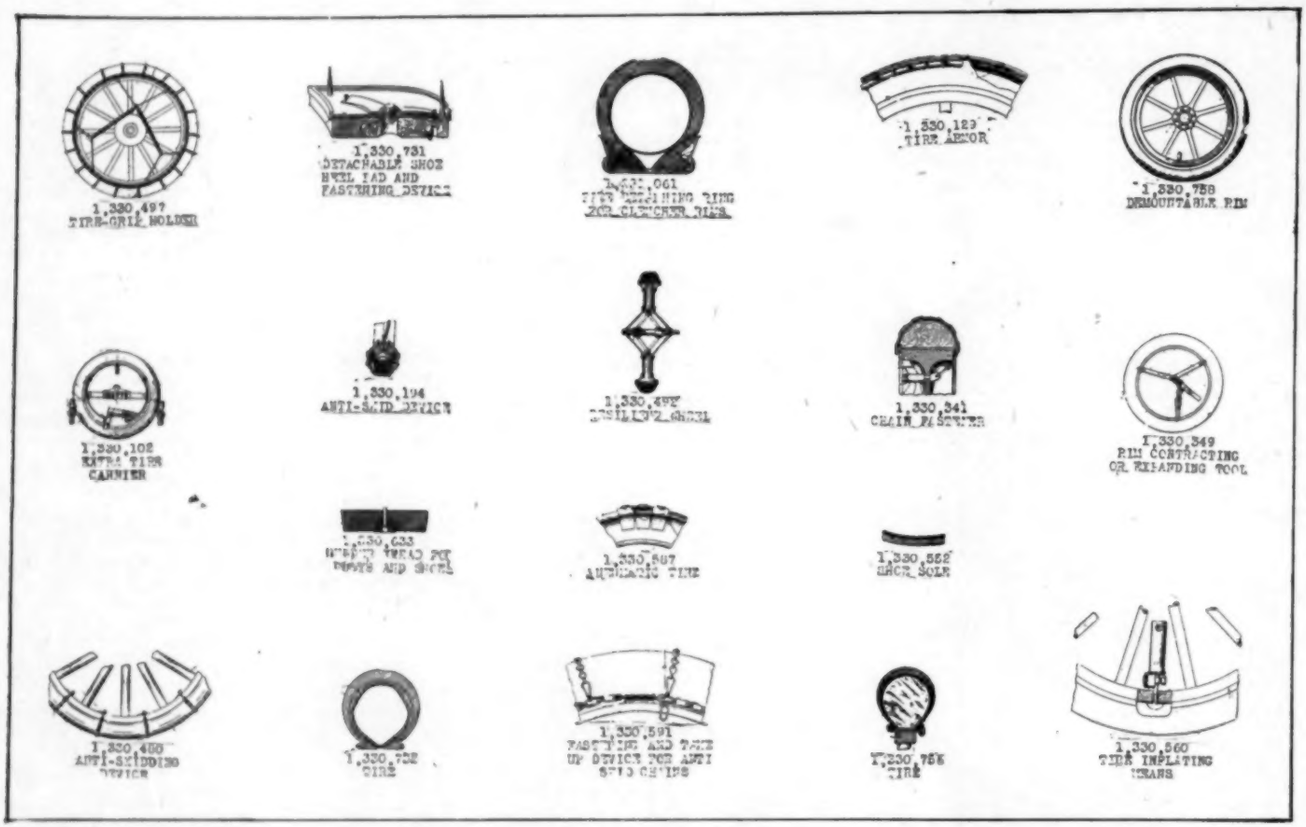
The Avalon Rubber Mfg. Co. at its annual meeting recently elected the following officers: J. F. Hower, president; L. K. Hower, vice-president; C. A. Carlton, secretary, and C. E. Siegfried, treasurer. These officers with W. A. Salisbury, George Landis and I. W. Maibach constitute the board of directors.

The company reports a successful year. Capital stock has been increased from $200,000 to $1,500,000.

American Rubber Patents

ISSUED FEBRUARY 10, 1920

1,330,061—To William Henry Dillet, Ralston, Okla. Tire-retaining ring for clencher-rims.
1,330,102—To Harry Walker, Anaheim, Cal. Extra-tire carrier.
1,330,129—To Thomas J. McManus, Milwaukee, Wis. Tire-armor.
1,330,194—To William H. Krug, Oshkosh, Wis. Anti-skid device.
1,330,340—To Reed Phillips, Salem, Ind. Chain-fastener.
1,330,349—To Frederick M. Ross and Harry L. Cook, Cincinnati, Ohio. Rim contracting or expanding tool.
1,330,480—To Herman C. Kreipke, Los Angeles, Cal. Anti-skidding device.
1,330,492—To James Joseph O'Neil, Pittston, Pa. Resilient wheel.



1,330,497—To Albert F. Saewert, Stirum, N. D. Tire-grip holder.
1,330,552—To Addison T. Saunders, Chicopee, Mass., assignor to A. G. Spalding & Bros., Jersey City, N. J. Shoe sole.
1,330,560—To Alonzo C. Tenney, Chicago, Ill. Tire-inflating means.
1,330,587—To Robert H. Henemier, New York, N. Y. Pneumatic tire.
1,330,591—To John W. Jepson, Buffalo, N. Y. Fastening and take-up device for anti-skid chains.
1,330,633—To Stuart Hilder, Glencarlyn, Va., assignor to Frank Berenstein, Chelsea, Mass. Rubber tread for boots and shoes.
1,330,731—To Bonnie Walters and Lew Arntz, Des Moines, Iowa. Detachable shoe-heel pad and fastening device therefor.
1,330,732—To Joseph C. Wise, Los Angeles, Cal. Tire.
1,330,756—To Egbert B. Brown, Los Angeles, Cal. Tire.
1,330,758—To Harry Guthrie, Chicago, Ill. Demountable rim.

New Plant Near Youngstown

Another rubber plant will be added to the Mahoning valley district on February 15 when the Akron Maderite Rubber and Tire Co. begins operations at its Newton Falls works. The plant will employ 300 men at first, and additional departments are proposed that will employ another 600.

Sealtyte Tube in Atlanta

Business men of Atlanta, Ga., have organized a company for the manufacture of the Sealtyte tire tube. The first unit of the plant has already been equipped and will turn out 300 tubes a day. Plans are in contemplation for a factory which will have a production of from 2,500 to 3,000 tubes daily.

The Victory Manufacturing Company is the name of the new firm and its officers are as follows: A. P. Phillips, president; George J. Reuter, vice president; W. H. Camp, vice president; B. Graham West, secretary-treasurer. The list of directors includes the above-mentioned officers and C. W. McClure, John A. Manget, W. M. Morris, Gordon A. Johnstone, A. McD. Wilson and Homer S. Prater. George F. McGlenn is chairman of the advisory board and James W. Austin is counsel.

National Tire Reorganizes

Announcement has been made to the effect that the stockholders of the National Tire and Rubber Company, of East Palestine, Ohio, have approved the plans for the company's reorganization as submitted by the directors of the organization. The company's capital will consist of $1,000,000 of seven per cent preferred stock and 75,000 shares of no-par common Half of the preferred stock will be issued immediately and will carry a bonus of four shares of common for each ten shares. Present common shareholders will be given three shares of the new issue for each share of the old common stock they hold. The company was capitalized at $1,000,000, of which $250,000 is in preferred stock.

K. F. and C. Tire to Expand

The K. F. and C. Tire and Rubber Corporation, of Roanoke, Va., has recently purchased fifteen acres of ground and several buildings of reinforced concrete, which will be used as a unit in the manufacture of K. F. and C. cord tires for both touring cars and trucks. Patents have been granted in the United States, Great Britain and its possessions, France and Italy for the tire while patents are pending in other countries.

The tire in question is neither a solid, pneumatic or cushion tire. It is built up of rubber cords and cord fabrics similar to those used in the construction of pneumatic tires. The fundamental principle underlying its construction is that of suspension, so employed as to utilize both the elastic and resilient properties of rubber.

Firestone Bowling Meet

Honors in the national telegraphic bowling tournament conducted recently by Ed. Day, director of recreation for the Firestone Tire and Rubber Company, went to the San Francisco branch five which won the A. G. Partridge Championship Trophy over sixty-four branches by rolling up a total of 2,758 pins. The quintet from the Golden Gate also annexed another of the tournament prizes when the team knocked over 967 pins in the second game, winning the L. G. Fairbank Cup offered the team registering the highest team score for a single game.

Austin Doyle, bowling on the St. Louis team which landed in second place with a score of 2,646, carried off the E. W. Be-Saw Cup offered for the highest individual average. His score was 643 pins. Fargo, N. D., bowling 2,548, took third place, nosing out Buffalo, N. Y., with 2,409 pins. Great Falls, Mont., scoring 2,304 points, was among the runners-up.